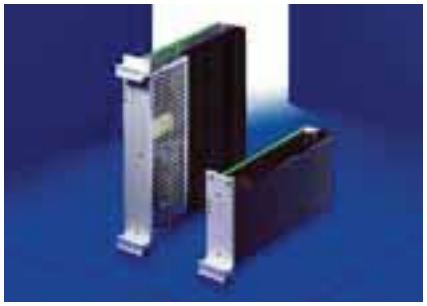

CPCI
AC-354
CPCI
AC-354
Power
Good

Power Supplies

System			U									Power supplies	Design	Page
cPCI	VME	ATX	1	2	3	4	5	6	7	9	13			
	■				■			■				Ripac power supplies	plug-in	74
■					■			■				Ripac power supplies	plug-in	74
												Accessories		75

Overview

3U, 6U plug-in (VME)



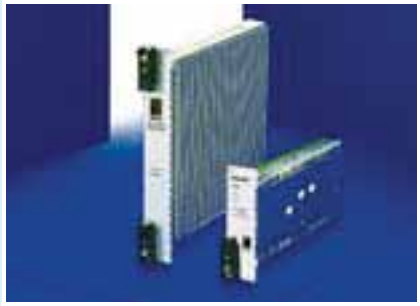
130, 160, 270 watts
See page 74 for details

Applications
Plug-in power supply units for VMEbus systems with integral VMEbus signalling.

Design features
- 130, 160, 270 watts
- 482.6 mm (19″) module to IEC 60 297-3
- Installation depth 160 mm
- Mounting in the subrack with the aid of guide rails
- Connection via connectors H15, IEC 60 603-2
- 3 outputs

User benefits
- 482.6 mm (19″) compatible
- Quick exchange
- Approvals: EN 60 950, VDE 0805 and IEC 950

3U, 6U plug-in (cPCI)



175, 200, 250, 350 watts
See page 76 for details

Applications
Plug-in power supply units for cPCI systems.

Design features
- 175, 200, 250, 350 watts
- 482.6 mm (19″) module to IEC 60 297-3
- Installation depth 160 mm
- Mounting in the subrack with the aid of guide rails
- Connection via Positronic connector 47-pole PICMG 2.9
- 4 outputs

User benefits
- 482.6 mm (19″) compatible
- Quick exchange
- Approvals: EN 60 950 A1 – A4, CSA 22.2, UL 1950, C
- Complies with PICMG specifications

3U, 6U plug-in & fixed (OpenVPX)

350, 500, 600, 660, 880, 1200 watts
See page 73 for details

Applications
Plug-in power supply units for OpenVPX systems.

Design features
- 350, 500, 660, 800 watts for VITA 62 plug-in & SOSA format
- 600 and 1200 watts for modular Ultramod fixed PSUs
- Installation depth 160 mm for plug-in, 3U or 6U
- Power interface boards available for plug in units

Pixus offers an extensive range of power supply units in various designs. The range includes 482.6 mm (19″) compatible and open frame.

VITA 62 Plug-in PSUs for OpenVPX

Features

- 3U and 6U versions in various wattages
- Various input voltages, typical includes18-48V DC, 85-264V AC or 3-phase 115VAC
- VITA 62 compliant
- Versions for SOSA applications, 12V
- Full MIL compliance, contact Pixus for individual specs

Ultramod Fixed PSUs for OpenVPX

Features

- 600W UX4 accepts up to 4 submodules, 1200W UX6 accepts up to 6 submodule
- Provide output power for VPX voltages & custom
- Dual Safety Approvals - UL/EN60950 2nd edition - UL/EN60601-1 3rd edition
- Highest Efficiency - up to 92%
- User & Field Configurable
- Standard Medical Features - Leakage Current <300µA (<150µA optional) - 2 MOPP - 4KV Isolation
- Lowest Acoustic Noise
- -40°C Startup Temperature
- Extra Ruggedised as Standard - Shock: >60G's - Vibration: MIL STD-810G
- All models feature active power factor correction as standard
- Product Options: Conformal Coating, Low Leakage Current, Connector, Cabling & Mounting options and Reverse Fans

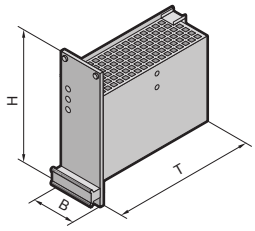
UltraMod powerPacs

	Model	Slots	Power	Medical Approval UL/EN60601-1 3rd edition	Industrial Approval UL/EN60950 2nd edition
UX	UX4	4	600W	Yes	Yes
	UX6	6	1200W	Yes	Yes

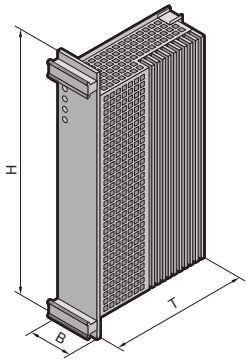
powerMods

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	Imax (A)	Power (W)	Remote Sense	Power Good
XgA	12.0	10.8-15.6	-	12.5	150	-	-
XgB	24.0	19.2-26.4	-	8.3	200	-	-
XgC	36.0	28.8-39.6	-	5.6	200	-	-
XgD	48.0	38.5-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	- -	3.0 3.0	72 72	- -	Yes Yes
XgG	2.5	1.5-3.6	1.15-3.6	40.0	100	Yes	Yes
XgH	5.0	3.2-6.0	1.5-6.0	36.0	180	Yes	Yes
XgJ	12.0	6.0-15.0	4.0-15.0	18.3	220	Yes	Yes
XgK	24.0	12.0-30.0	8.0-30.0	9.2	220	Yes	Yes
XgL	48.0	28.0-58.0	8.0-58.0	5.0	240	Yes	Yes
Xg1	2.5	1.5-3.6	1.15-3.6	50.0	125	Yes	Yes
Xg2	5.0	3.2-6.0	1.5-6.0	40.0	200	Yes	Yes
Xg3	12.0	6.0-15.0	4.0-15.0	20.0	240	Yes	Yes
Xg4	24.0	12.0-30.0	8.0-30.0	10.0	240	Yes	Yes
Xg5	48.0	28.0-58.0	8.0-58.0	6.0	288	Yes	Yes

Power supplies for VME, plug-in



1

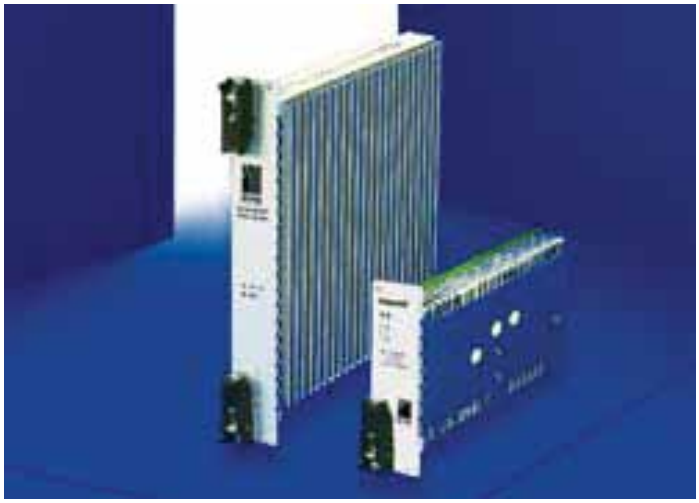


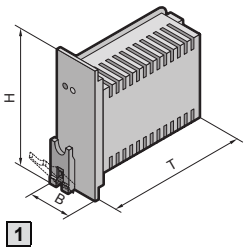
2

Connector assignment, see page 186
Characteristic curve diagram, see page 186
Detailed drawing, see page 186

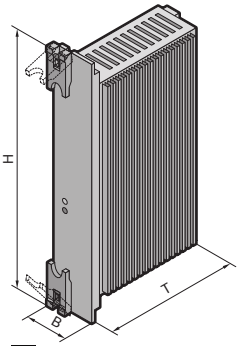
	1			2		
Height (H)	3U			6U		
Width (B)	10 HP	12 HP		8 HP	12 HP	
Depth (T) mm	170.0	170.0		170.0	170.0	
Model No. RP power supply	**3686.469**	**3686.470**		**3686.471**	**3685.306**	
Model No. RP front panel	**3685.304**	**3685.305**		**3686.472**	**3685.307**	
Output sizes						
Output	1	2	3	1	2	3
Output voltage	5 V	+12 V	–12 V	5 V	+12 V	–12 V
Output current 3U, 10 HP/6 U, 8 HP	14 A	5 A	2 A	20 A	5 A	2 A
Output current 3U, 12 HP/6 U, 12 HP	20 A	5 A	2 A	35 A	6 A	2 A
Maximum power output	130 W (10 HP), 160 W (12 HP)			160 W (8 HP), 270 W (12 HP)		
Setting range of output voltage	± 5 %	–		± 5 %	–	
Load compensation (load variation 0 – 100 %)	< 0.1 %	< 1 %		< 0.1 %	< 1 %	
Line regulation ($U_{e\ min.}$ – $U_{e\ max.}$)	< 0.2 % at 230 V AC + 15 % – 19 %			< 0.2 % at 99 – 138/187 – 264 V AC		
Base load	–					
Compensation time	< 1 ms at I_a 20 – 80 %					
Infeed compensation (Sense)	± 0.25 V	–		± 0.25 V	–	
Residual ripple (max.)	< 35 mV		< 20 mV	< 45 mVss	< 30 mVss	< 15 mVss
Interference voltage	50 mV typ. (bandwidth 20 MHz)			< 80 mV typ. (bandwidth 20 MHz)		
Temperature coefficient	0.025 %/K					
Overvoltage protection (automatically recovery)	125 % + 5 %	125 % + 10 %		125 % ± 5%	120 % ± 10 %	
Overload protection	typ. 110 % $I_{a\ rated}$, U/I characteristic curve acting on all outputs, outputs short circuit-resistant					
Overtemperature protection	Cuts out if the internal temperature is too high, cuts in again with hysteresis					
AC-FAIL, SYSRESET	TTL signals with 48 mA drive current, active low					
ON delay	typ. 500 ms			< 0.5 s		
Ramp-up time	< 30 ms			≤ 50 ms		
Input variables						
Mains voltage U_e	AC 187 – 264 V, 50/60 Hz with automatic changeover to AC 90 – 138 V (in the range 90 – 94 V AC only 85 % rated load) or 264 – 347 V DC			AC 187 – 264 V, 50/60 Hz with automatic changeover to AC 99 – 138 V		
Mains frequency	47 – 63 Hz					
Efficiency (typ.)	80 %					
Startup current limitation	< 10 As typ. – in cold state < 15 As typ. – in warm state			< 25 As typ. – in cold state < 35 As typ. – in warm state		
Fuse	3.15 AT			4 AT		

Ripac Power supplies





1



2

Connector assignment, see page 185
Detailed drawing, see page 185

	1												2			
Height (H)	3U												6U			
Width (B)	8 HP												8 HP			
Depth (T) mm	170.0												170.0			
Model No. RP AC power supply	**3688.534**				**3688.694**				**3688.695**				**3688.528**			
Model No. RP DC power supply	**3688.537**				**3688.655**				**3688.696**				**3688.530**			
Output sizes																
Output	U_1	U_2	U_3	U_4	U_1	U_2	U_3	U_4	U_1	U_2	U_3	U_4	U_1	U_2	U_3	U_4
Output voltage	5 V	3.3 V	12 V	–12 V	5 V	3.3 V	12 V	–12 V	5 V	3.3 V	12 V	–12 V	5 V	3.3 V	12 V	–12 V
Output current	25 A	20 A	6 A	1 A	30 A	25 A	6 A	1 A	33 A	33 A	6 A	1 A	40 A	40 A	9 A	1 A
Outpu current U_1 and U_2	30 A max.				38 A max.								80 A max.			
Maximum power output	175 W				200 W				250 W				350 W			
Base load (only U_1)	5 %	–			5 %	–			5 %	–			10 %			
Load compensation (dyn.)	< 3 % at 25 % load variation (1 A/µs) 1 % after 300 µs															
Line regulation	< ± 1 % (90 – 264 V AC)												< ± 1 % (90 – 264 V AC) U_1, U_2, U_3			
Infeed compensation (Sense)	0.25 V	0.25 V	0.25 V	–	0.25 V	0.25 V	0.25 V	–	–	–	–	–	0.25 V	0.25 V	0.25 V	–
Residual ripple (PARD)	50 mV or 1 % (bandwidth 20 MHz)															
Temperature coefficient	< ± 0.02 %/K (0° – 50°C) after 20 min. start-up time															
Overvoltage protection	125 % ± 10 %, reset by switching on again															
Overload protection	Current limiting of all outputs, automatic return at normal load															
Overtemperature protection	At overtemperature switches of f all outputs, automatic return at normal temperature															
Input variables																
Mains voltage or DC input	90 – 264 V AC, 47 – 63 Hz, 3.2 A max. 36 – 72 V DC, 7.9 A												90 – 264 V AC, 47 – 63 Hz, 7 A 40 – 72 V DC, 14 A			
Power Factor	0.99 at V AC 115 V, full load															
Starting current	15 A (115 V AC) cold start, 30 A (230 V AC) cold start															
Fuse	3.15 A, 250 V AC or 10 A, DC												10 A, 250 V AC or 20 A, DC			
Signals and control cables																
Power Fail (Pin 42)	In the event of a mains failure > 4 ms before output voltages exit control range. Power fail also triggered by failure or undervolta ge of V1 or V2 (3 U) or any output (6 U)															
DEG (pin 38)	In case of overtemperature												–			
Remote enable	Use logic “0” (TTL level)															
Remote inhibit	Use logic “1” (TTL level)															
LED displays, two-color	Green: “Power ON” and output voltages present Red: Error															

General specifications, see page 185.

cPCI power supplies

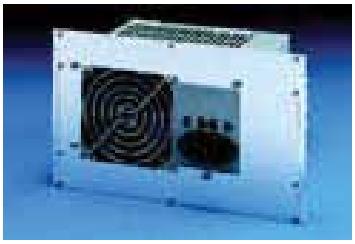
Plug-type, 180 W
- Module, 3 U, 12 HP, plug-in
- Connector M24/8/IEC 60 603-2
- Automatic changeover 120/230 V AC
- All outputs permanently short-circuit resistant
- SELV outputs to EN 60 950
- Overvoltage protection on the primary and secondary circuits
- Overtemperature protection
- Control inputs: ENABLE, INHIBIT
- Signal output: DERATE
- EMC standards EN 50 081-1 and EN 50 082-2
- IEC 60 950/VDE 0805-SELV, protection category I, VDE 0100

Technical specifications:
180 W max.
5.1 V/20 A
3.3 V/14 A
12.0 V/2 A
–12.0 V/1 A

Detailed data specification sheet available on request.

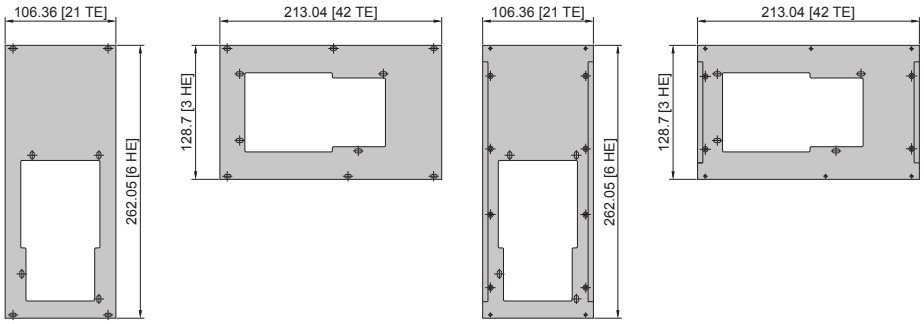
Height U	Width HP	Model No. RP	
		Power supply	Front panel for power supply
3	12	**3686.682**	**3685.330**

ATX power supplies



for ATX power supply
Front panel with cut-outs for mounting the ATX power supply units in the subrack.
Material:
Aluminum, clear-chromated
Supply includes:
Assembly parts,
EMC gaskets (with EMC version).

U	HP	Model No. RP	
		EMC	Non-EMC
3	42	**3685.331**	**3685.328**
6	21	**3685.332**	**3685.329**



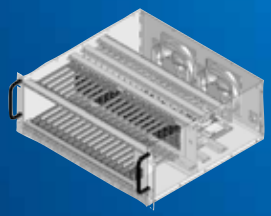
Rugged Enclosures Overview

Pixus offers custom and standard ruggedized chassis in rackmount, portable, and ATR enclosure formats. Utilizing our backplane design expertise, convection and conduction cooling capabilities, and superb rugged solutions with key partners, Pixus has a solution for you.

The enclosures can be designed to meet:

- MIL-STD-810 for shock/vibration, environmental
- MIL-STD-901D for shock/vibration
- MIL-STD-461 for EMI
- ARINC 404 and 600 requirements
- Much more, contact Pixus for details

Whether its an ITAR requirement, a standard product, or a custom design, contact our team to discuss your rugged application. Pixus can also provide various conduction-cooled boards from processors/SBCs, graphics, FPGAs, and more.



19” Rugged Rackmount Systems

The Pixus 19” rugged rackmount systems are based on the modular open-standard COTS (Commercial Off the Shelf) Eurocard approach. This allows us to configure virtually unlimited tailored configurations of a chassis with little to no customization. This provides standardization with the benefits of an open-standard architecture, which include:

- Multi-vendor options, more choices
- Less risk, not relying on one vendor
- Selection options of “best in class” for all modules
- Proven design in commercial, industrial, and MIL/Aero
- Less obsolenscence risk with multiple vendors
- Lower prototyping/development costs and time-to-market
- Typical plug-in modules are 3U or 6U with a 160mm depth.

Rugged 19” Rackmount

Height	Architecture Options	Slots	Ruggedization	Notes	Part Number Prefix	Part No.
1U	MicroTCA/AMC	6	MIL-810/901 for shock vibration	GPS/IEEE1588/ SyncE/NTP	PXS01R6	PSM_VTAP10
5U	OpenVPX or other Eurocard	Up to 20	MIL-810/901 for shock vibration, MIL 461 for EMI	Accepts 3U Boards	PXS05R20	PSM_VTAP40
8U	OpenVPX or other Eurocard	Up to 20	MIL-810/901 for shock vibration, MIL 461 for EMI	Accepts 6U Boards	PXS08R20	PSM_VTFC03

ATR ENCLOSURES

Modular ATR sizes of 1/2 and 3/4 with various heights and depths. Contact Pixus to discuss your application. The HEX version is a top-of-the-line MIL qualified unit with heat exchangers for high wattage requirements.

SMALL FORM FACTOR SOLUTIONS

From Small Form Factor solutions to application-specific conduction cooled solutions, Pixus offers a wide range of configurations. Give us a call at 916-297-0020 to discuss your SWaP requirements and performance specifications.

Rugged ATR or Purpose-built

Size	Architecture Options	Payload Slots	Ruggedization	Notes	Part Number Prefix
1/2 ATR*	OpenVPX or other Eurocard	2 to 4	MIL-810/901 for shock vibration	Rear-loaded, VITA 66/67 & SOSA options	ATR012
1/2 ATR*	OpenVPX or other Eurocard	5 to 12	MIL-810/901 for shock vibration, MIL 461 for EMI	Accepts 3U Boards, Sealed conduction VITA 66/67 & SOSA options”	ATR112
5/8 ATR*	OpenVPX or other Eurocard	Up to 6	MIL-810/901 for shock vibration, MIL 461 for EMI	Accepts 3U Boards, Sealed conduction with heat exchanger VITA 66/67 & SOSA options	ATR012-HEX
1/2 ATR	OpenVPX or other Eurocard	11 to 15	MIL-810/901 for shock vibration, MIL 461 for EM	Accepts 3U Boards, liquid-cooled	ATR012-LIQ

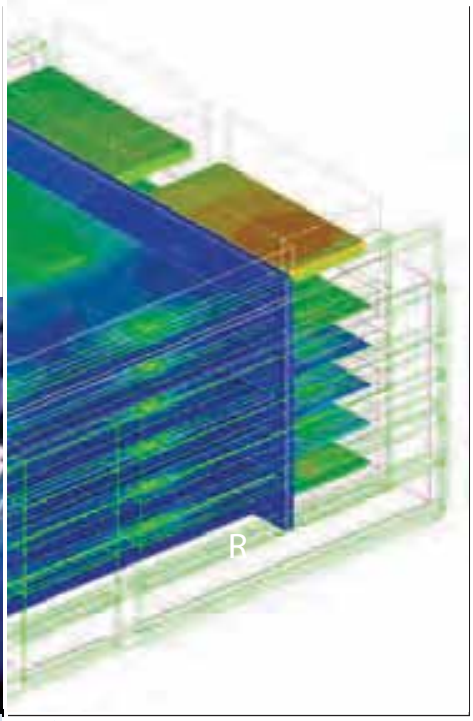
*consult factory for other size or cooling options

Climate control for Subracks

Heat shortens the service life of equipment leading to failure, and also diminishes the high performance of electronics.

The problem lies in high heat losses and compact installation spaces. Effective heat dissipation is therefore essential to ensure long service life and operational reliability.

As well as the components shown below, Pixus also offers a range of other 482.6 mm (19˝) cooling systems and rack-mounted fans.

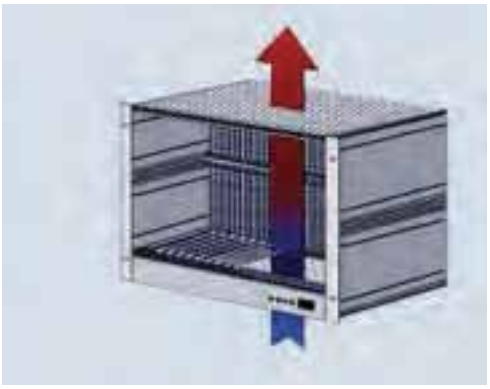


Diagonal cooling

The air baffle plate in combination with..

. . . the air block panel ensures targeted air routing inside the subrack.

RiCool high-capacity fan for heat losses of 700 W or more.



CFD (Computational Fluid Dynamics)

With the aid of CFD, climate control solutions may be optimised even before the first prototype has been built.

The Pixus portfolio of services includes:

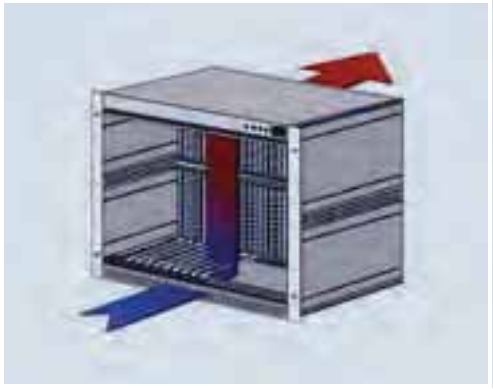
- Visualisation of temperature variations
- Visualisation of air flows
- Localisation and elimination of heat accumulation and hotspots
- Targeted optimization of climate control
- Positioning of temperature sensors and smoke alarms.

Vertical ventilation

Rack-mounted fans are installed below the subrack in the enclosure. This ensures permanent air circulation to prevent the formation of hotspots.

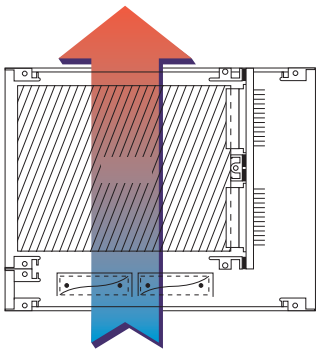
Fans are installed directly in the subrack, below or above the PCBs, with the aid of fan mounting plates, thereby preventing heat accumulation.

AC and DC fans in various output categories, can be fitted.



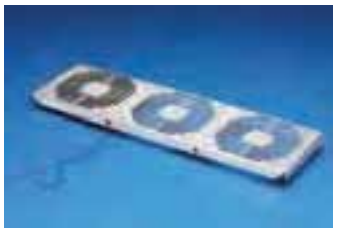
Overview of benefits

- Climate control solutions for a variety of applications (vertical cooling, diagonal cooling)
- Detailed solutions for targeted air routing
- The RiCool flat-pack offers maximum performance (204 m^3/h) coupled with minimal space requirements (1 U).



Vertical cooling from bottom to top

- Air flow via normal convection or forced cooling devices in the enclosure or housing outside of the subrack.
- Vertical forced air flow, supported by fans installed at the bottom of the subrack (1 U). For the cooling of enclosures and housings, rackmounted fans, see page 88 and rackmounted cooling units are available.



Fan mounting plate

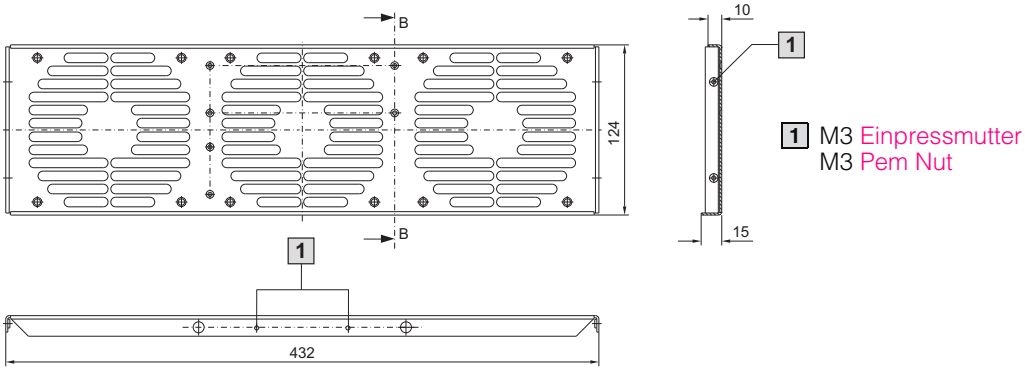
For the installation of 120 mm fans and filter modules in subracks. For mounting on the subrack side panels.

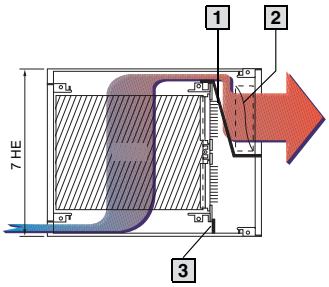
U	For PCB depth mm	No. of fan mounting plates required	HP	Model No. RP
1	160	1	84	**3684.317**
	220	1		
	280	2		
	340	2		
	400	3		

Also required:

1 terminal block is required for each subrack.

Packs of	Model No. RP
1	**3686.805**





Diagonal cooling from front to back

Diagonal air flow from front to back allows individual cooling of PCBs in vertical installation position. An air baffle and air partition ensure controlled air flow.

1 Air baffle, see page 83

2 Fan (mounted on the rear panel), see page 85

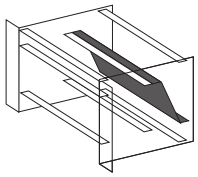
3 Air partition, see page 83

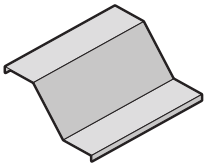
Air baffle

For controlled air flow in 7 U subracks.
For mounting on subrack side panels with the aid of mounting blocks.

Material:
1 mm aluminum

Supply includes:
Assembly parts.



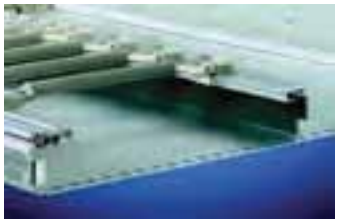


Subrack depth mm	Model No. RP
285	**3685.302**
345	**3685.303**
405	**3684.320**
465	**3684.321**
525	**3684.322**

Custom versions available upon request.

Also required:

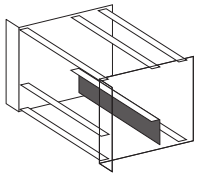
Mounting blocks, see page 125

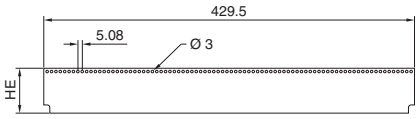


Air partition

For controlled air flow in the subrack. The partitions are mounted on the horizontal rails together with the backplanes.

Material:
Epoxy



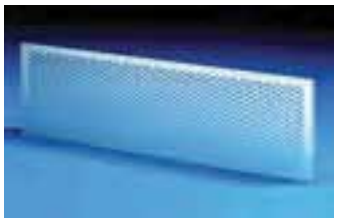


U	Model No. RP
1/2	**3684.870**
1	**3684.871**
3	**3684.872**

Custom versions available upon request.

Also required:

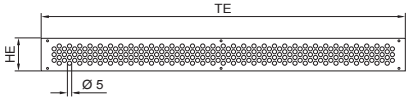
Fastening screws and washers,
packs of 100, Model No. RP 3684.019,
see page 159

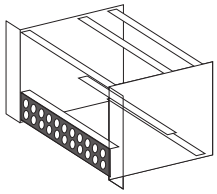


Front/rear panels for ventilation

Material:
2.5 mm aluminum

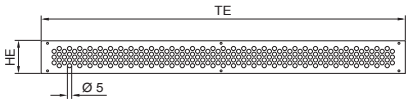
Surface finish:
Anodized,
clear-chromated (EMC version)





EMC version supply includes:
1 front panel,
1 contact strip,
1 gasket strip,
1 verical EMC gasket,
assembly parts.

EMC



U (HE)	HP (TE)	Packs of	Model No. RP
1	84	1	**3684.812**
2	84	1	**3684.813**
3	84	1	**3684.814**

Custom versions available upon request.

Also required:

Collar screws (slotted) and plastic collars,
packs of 100 sets, Model No. RP 3658.160,
see page 159

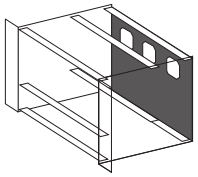
EMC version:

U (HE)	HP (TE)	Packs of	Model No. RP
1	84	1	**3684.281**
2	84	1	**3684.282**
3	84	1	**3684.283**

Custom versions available upon request.

Also required:

Centering screws, see page 160



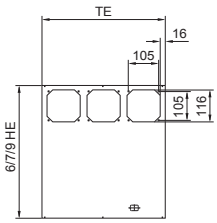
Rear panels for fan installation

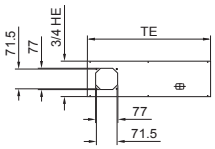
Material:
2.5 mm aluminum

Surface finish:
Anodized,
clear-chromated (EMC version)

EMC version supply includes:
1 rear panel,
1 contact strip,
1 gasket strip,
1 vertical EMC gasket,
assembly parts.

EMC





U (HE)	HP (TE)	For fans mm	Packs of	Model No. RP
3	85	80	1	**3684.839**
4	85	80	1	**3684.840**
6	85	120	1	**3684.841**
7	85	120	1	**3684.842**

Custom versions available upon request.

Also required:

Collar screws (slotted) and plastic collars,
packs of 100 sets, Model No. RP 3658.160,
see page 159

EMC version:

U (HE)	HP (TE)	For fans mm	Packs of	Model No. RP
3	84	80	1	**3684.284**
4	84	80	1	**3684.285**
6	84	120	1	**3684.286**
7	84	120	1	**3684.287**

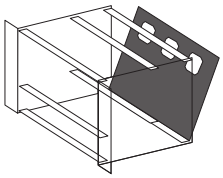
Custom versions available upon request.

Also required:

Centering screws, see page 160

Accessories:

Fans, see page 85



Rear panels, horizontally hinged for fan installation

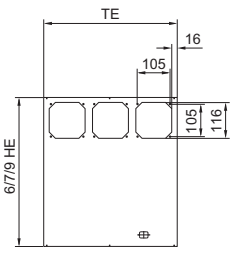
Material:
2.5 mm aluminum

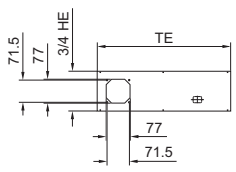
Surface finish:
Anodized,
clear-chromated (EMC version)

Supply includes:
1 rear panel,
1 set of hinges,
assembly parts.

EMC version supply includes:
1 rear panel,
1 contact strip,
1 gasket strip,
1 vertical EMC gasket,
1 set of hinges,
assembly parts.

EMC





U (HE)	HP (TE)	For fans mm	Packs of	Model No. RP
3	85	80	1	**3684.304**
4	85	80	1	**3684.305**
6	85	120	1	**3684.306**
7	85	120	1	**3684.307**

Custom versions available upon request.

Also required:

Collar screws (slotted) and plastic collars,
packs of 100 sets, Model No. RP 3658.160,
see page 159

EMC version:

U (HE)	HP (TE)	For fans mm	Packs of	Model No. RP
3	84	80	1	**3684.311**
4	84	80	1	**3684.312**
6	84	120	1	**3684.313**
7	84	120	1	**3684.314**

Custom versions available upon request.

Also required:

Centering screws, see page 160

Accessories:

Fans, see page 85

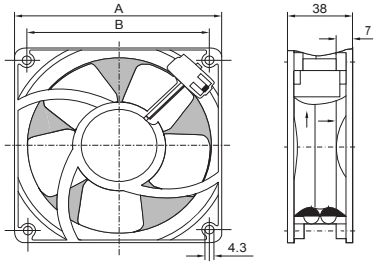
AC fans

For subracks and microcomputer systems.

Supply includes:
1 fan without connection cable.

Also required:

Assembly screws,
packs of 1 set, Model No. RP 3685.197,
see page 160



AC fans

Dimensions			Bearing	Rated voltage V/Hz	Power watts	Noise level dB (A)	Temperature range °C	Volume flow m^3/h	**Model No. RP**
Fan mm	A mm	B mm							
80	79.5	71.5	Ball bearing	115/60	11.0	42	–40 to +95	57	**3686.645**
80	79.5	71.5	Ball bearing	230/50	12.0	37	–40 to +90	48	**3686.646**
120	119.0	105.0	Ball bearing	115/60	18.0	51	–40 to +90	180	**3686.643**
120	119.0	105.0	Ball bearing	230/50	19.0	47	–40 to +85	160	**3686.644**

Connection cable

Cable length mm	Packs of	**Model No. RP**
610	1	**3686.658**
1000	1	**3686.659**

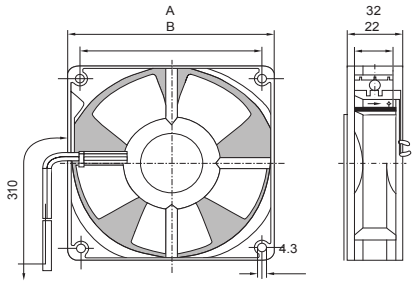
DC fans

Optionally available with temperature-dependent speed control via additional temperature sensor.

Supply includes:
1 fan with connection cable (310 mm).

Also required:

Assembly screws,
packs of 1 set, Model No. RP 3685.197,
see page 160
Temperature sensor for DC fans
with speed control,
see page 86



DC fan with speed control and alarm signal

Dimensions			Bearing	Rated voltage V (DC)	Voltage range Volt	Power watts	Noise level dB (A)	Temperature range °C	Temperature max. °C	Volume flow m^3/h	**Model No. RP**
Fan mm	A mm	B mm									
80	79.5	71.5	Ball bearing	12	8.0 – 14.0	2.2	34	–20 to +65	65	48	**3686.649**
80	79.5	71.5	Ball bearing	24	21.6 – 26.4	2.4	36	–20 to +65	65	54	**3686.650**
120	119.0	104.8	Ball bearing	12	8.0 – 12.6	5.4	45	–20 to +65	65	170	**3686.647**
120	119.0	104.8	Ball bearing	24	21.0 – 27.0	5.4	45	–20 to +65	65	170	**3686.648**

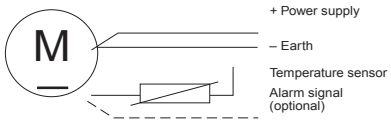
DC fan without speed control and without alarm signal

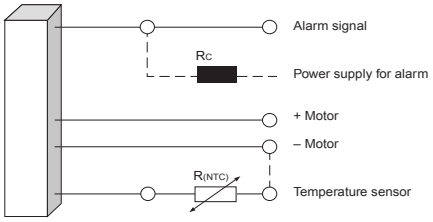
Dimensions			Bearing	Rated voltage V (DC)	Voltage range Volt	Power watts	Noise level dB (A)	Temperature range °C	Temperature max. °C	Volume flow m^3/h	**Model No. RP**
Fan mm	A mm	B mm									
80	79.5	71.5	Ball bearing	12	6.0 – 15.0	1.8	34	–20 to +75	75	48	**3687.612**
80	79.5	71.5	Ball bearing	24	12.0 – 28.0	2.1	34	–20 to +75	75	48	**3687.613**
120	119.0	104.8	Ball bearing	12	6.0 – 15.0	2.6	39	–20 to +75	75	140	**3687.614**
120	119.0	104.8	Ball bearing	24	12.0 – 28.0	2.6	39	–20 to +75	75	140	**3687.615**

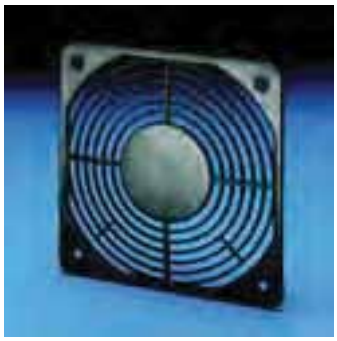
Temperature sensor

For DC fans 12/24 V with speed control.
Temperature sensor:for DC fans

Voltage	Packs of	Model No. RP
12 V/24 V (DC)	1	**3686.657**







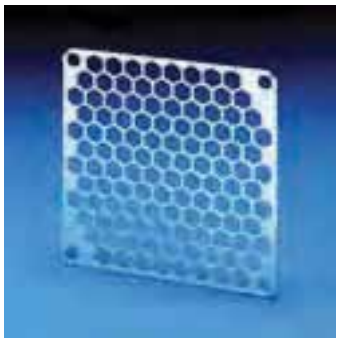
Finger guard

For AC fans and DC fans.

Material:
Polyamide, self-extinguishing to UL 94-V0

Color:
Black

For fans mm	Packs of	Model No. RP
80	1	**3686.656**
120	1	**3686.655**

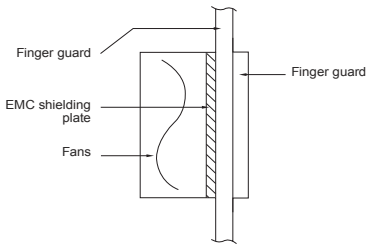


EMC shielding plate

For AC fans and DC fans.

Material:
1 mm aluminum, clear-chromated

For fans mm	Packs of	Model No. RP
80	1	**3686.359**
120	1	**3686.329**



Air block panel

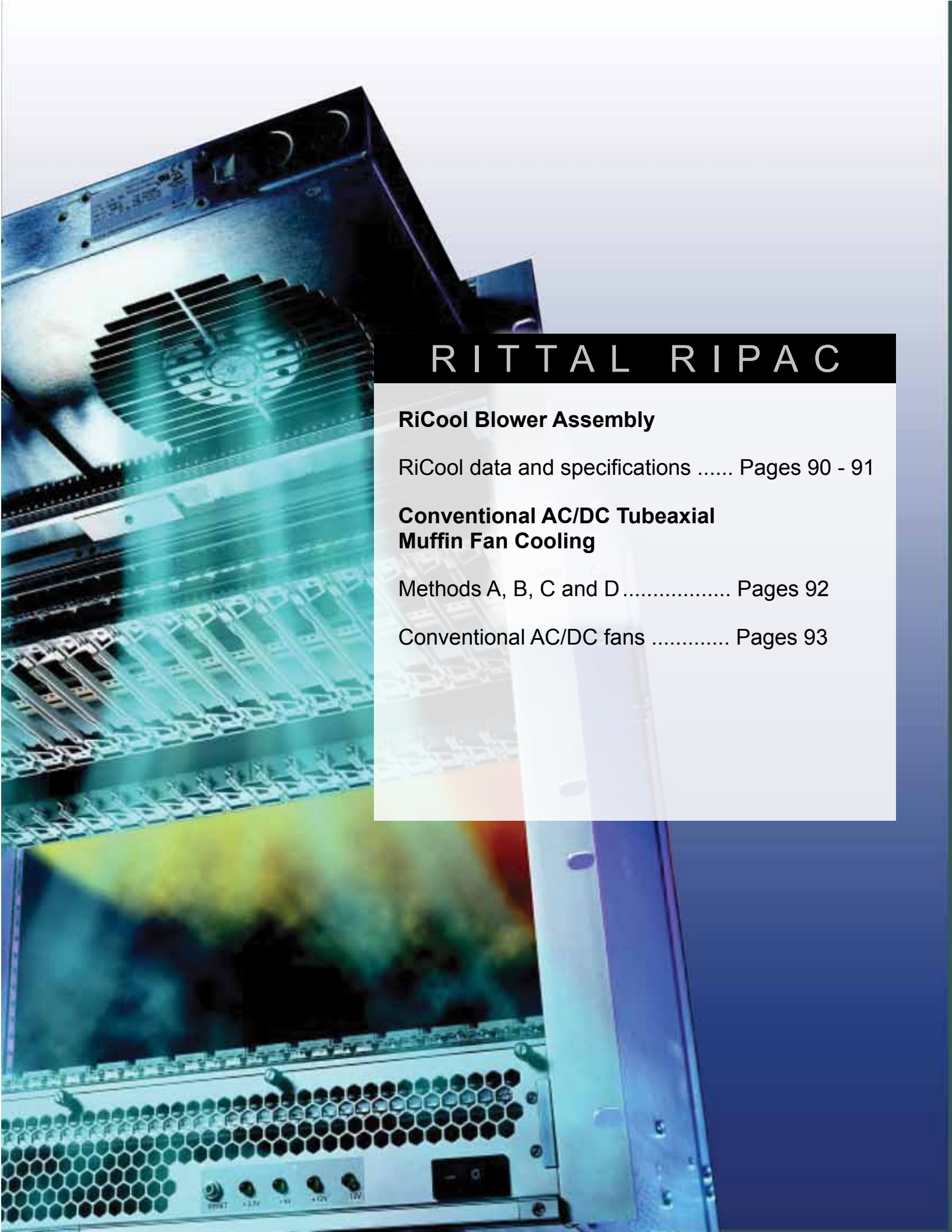
for unused slots
see page 131

Supercool, Hot Swappable RiCool System Blowers...

COOL SOLUTIONS.

Cool Off With Rittal RiCool.

Rittal Ripac has literally set the standard for packaging solutions. And our new RiCool Blower Assembly helps to keep the innovations coming. These supercool, hot swappable blowers deliver 220CFM system airflow at 70% efficiency (versus 20% when using typical 4.7" tubeaxial muffin fans) in only a 1U form factor. RiCool is an ideal solution for systems with PCBs exceeding 35W to 70W (average at 21 slots) heat loss and requiring a hotplug redundant blower. In addition, Rittal also offers a wide variety of conventional AC and DC fan solutions for applications which do not exceed 30W (average at 21 slots) heat dissipation. So when things heat up, cool them off with Rittal Ripac cooling solutions.



RITTAL RIPAC

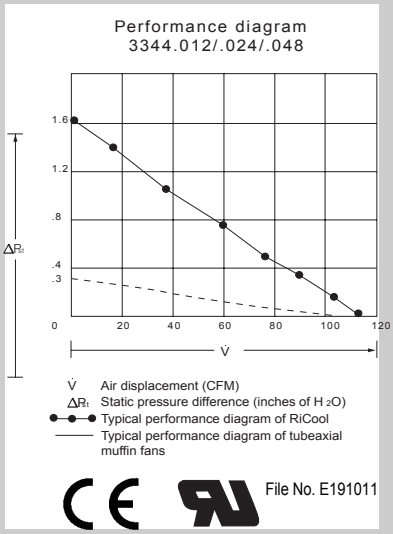
RiCool Blower Assembly

Conventional AC/DC Tubeaxial Muffin Fan Cooling

The powerful RiCool blower assembly is specially designed to provide effective cooling in densely packed systems where the average board has a heat loss of above 30 Watts at 21 slots and performs well at an average heat loss at 70W per PCB (at 21 slots). Low noise (48dBa at $^{3}/_{4}$ speed and a life of approx. 60,000 hrs at 40°C) makes this blower the ideal solution for today's systems.

Air is drawn through the PCBs and then exhausted out the back of the system via a powerful curved impeller blower, while using only 1U rack space.

Especially effective for such applications as telecommunications where rack height restrictions exist. Also targeted for industrial and scientific research applications.



File No. E191011

Features And Benefits

- Uses only 1U of rack height
- Available in 12V, 24V and 48V DC
- Fan alarm via fan speed sensor
- Optional speed control
- Designed to move air effectively through densely packed subracks
- Easy access
- Hot swapable for fast and easy maintenance
- No extra ducting required
- Ability to use two blowers in 19" applications
- Locked rotor protection
- Polarity protection
- Automatic restart capability

Configuration

Material:
Clear zinc chromate steel housing

Includes:
Complete fan assembly: weight 5 lbs. ready for mounting in subrack, with Molex 15-06-0061 6 pin male mini-fit connector

Airflow Direction:
Exhausts outward from back of subrack

Power Consumption:
48W

Operating Temperature:
-10°C to +60°C / +14°F to +140°F

RiCool Blower Performance Data

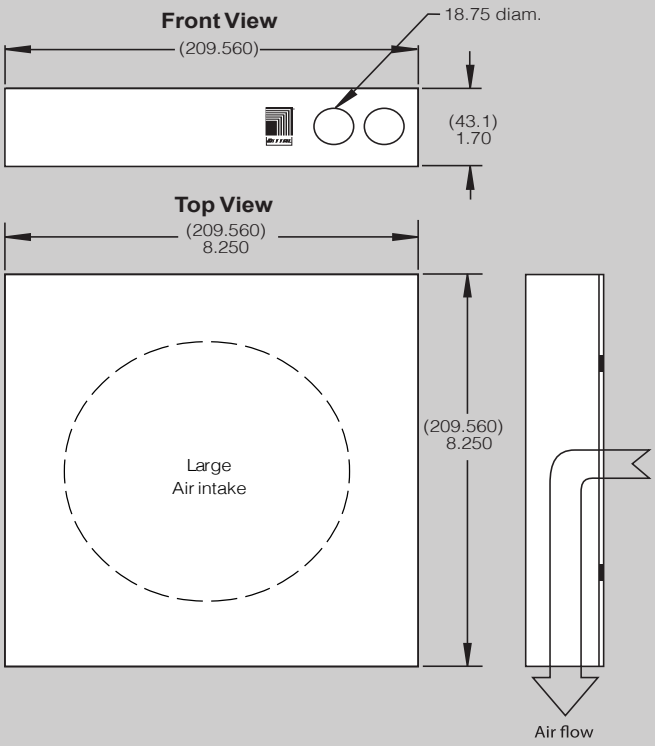
- CFM..... 110CFM (190m³/h)
- Static pressure ..... 4.07 CM (1.6 inch) of H_2O
- Voltages..... 12, 24, 48V DC
- Rated current ..... 4, 2, 1 Amps
- Noise level free blowing .. 56.2dBa
- Weight ..... 5 lbs. (2.3 Kg)

RiCool Blower Construction

- Housing ..... Cold rolled steel
- Impeller ..... Noryl™ 94V0
- Bearing ..... Ball bearing
- Power/alarm connector Molex15-06-0061
- Alarm signal ..... rpm sensor
- Life at full speed ... 60,000 hrs @ 40°C
  50,000 hrs @ 50°C

Please inquire for separate AC/DC RiCool power supply.

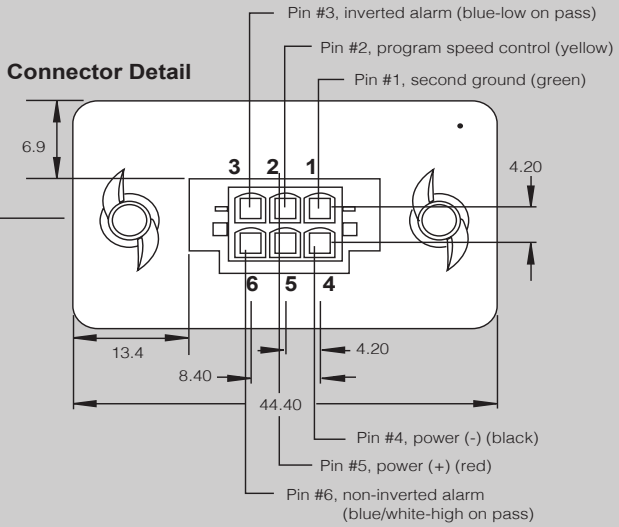
RiCool is also available in 19" blower trays (see inset photo at top). Please note that the airflow, power consumption, rated current and weight are double for the 19" fan trays.



Thermistors needed for RiCool speed control:

PTC thermistor for 12V **Part No. 3686887**
PTC thermistor for 24V **Part No. 3686888**
PTC thermistor for 48V **Part No. 3686889**
Note: the thermistor comes with a 600mm (2') cable.

Pin Location Description
Pin #1, second motor ground (green)
Pin #2, program speed control (yellow)
Pin #3, inverted alarm (blue-low on pass)
Pin #4, power (-) (black)
Pin #5, power (+) (red)
Pin #6, non-inverted alarm (blue/white-high on pass)



Individual RiCool Blowers

Part No.	3344.012	3344.024	3344.048
Voltage	12V DC (6-14V)	24V DC (16-28V)	48V DC (32-56V)
Airflow (free air delivery)	110CFM/190m³/h	110CFM/190m³/h	110CFM/190m³/h
Power consumption	48W	48W	48W
Rated current	4.0A	2.0A	1.0A
Noise level (dBa)	56dBa	56dBa	56dBa
Temperature range	-10 °C to +60°C	-10 °C to +60°C	-10 °C to +60°C
Weight	5 lb. (2.3 kg)	5 lb. (2.3 kg)	5 lb. (2.3 kg)
Power/alarm connector	Molex 15-06-0006	Molex 15-06-0006	Molex 15-06-0061
Alarm signal	rpm sensor, non-isolated, high on pass	rpm sensor, non-isolated, high on pass	rpm sensor, non-isolated, high on pass

19" RiCool Blower Trays

Part No.	3686.879	3686.880	3686.881
Voltage	12V DC (6-14V)	24V DC (16-28V)	48V DC (32-56V)
Airflow (free air delivery)	220CFM/380m³/h	220CFM/380m³/h	220CFM/380m³/h
Power consumption	96W	96W	96W
Rated current	8.0A	4.0A	2.0A
Noise level (dBa)	56dBa	56dBa	56dBa
Temperature range	-10 °C to +60°C	-10 °C to +60°C	-10 °C to +60°C
Weight	10 lb. (4.6 kg)	10 lb. (4.6 kg)	10 lb. (4.6 kg)
Power/alarm connector	Molex 15-06-0006	Molex 15-06-0006	Molex 15-06-0061
Alarm signal	rpm sensor, non-isolated, high on pass	rpm sensor, non-isolated, high on pass	rpm sensor, non-isolated, high on pass

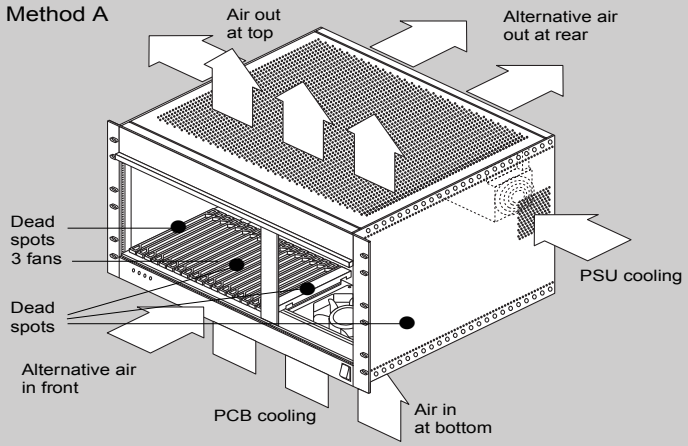
Alarm Characteristics

- Pin #3 inverted alarm, max load of 0.05A at 60V DC
- Pin #6 non-inverted alarm, max load of .015A at 5.5V DC
- Trigger speed at 40% of max speed
- 10 second signal delay
- Alarm condition causes +5V DC increase in supply voltage measured between pin #3 and pin #1
- Customer supplied pull-up resister at interfacing alarm required to limit current to blower alarm circuit

Conventional AC/DC Tubeaxial Muffin Fans....

SYSTEM COOLING

Method A



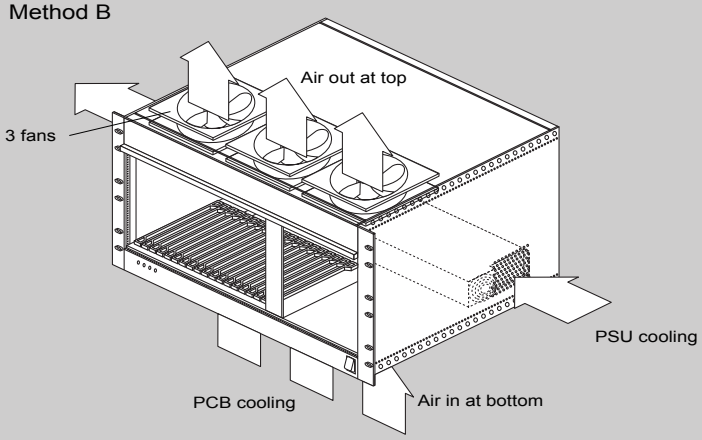
System Cooling Method A

Method A is the most common way of system cooling and good for PCBs which do not exceed 30 Watt heat dissipation, since the fans have a “dead” spot over the center of the fan and typically “dead” spots between the fans (4 dead spots) at 21 slots. It is advisable to place the fans at least 50mm (2”) below the boards so that the air can “fan” out, thus air will reach all parts of the boards (this will add overall system height).

The efficiency of these tubeaxial muffin fans operating at maximum generated 7.62mm/0.3” of H_2O of static pressure under these conditions may be as little as 20%. An additional metal fan chassis design is required making replacement of failed fans difficult and time consuming.

System shut down at fan replacement may be required.

Method B

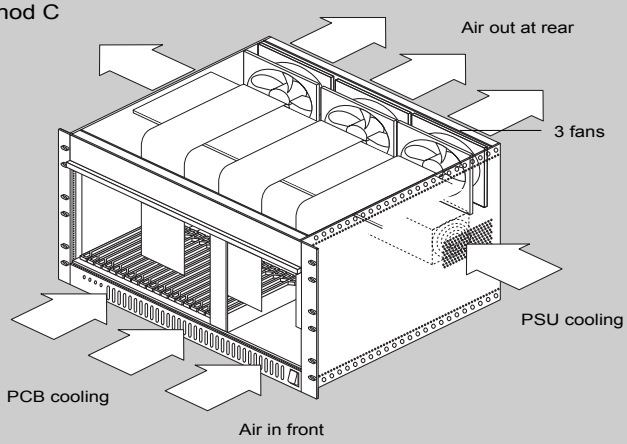


System Cooling Method B

Method B is not often used, as the fans may be in the way of top mounted drives, power supplies, etc.

However, this method is an improvement over Method A, as the efficiency of these muffin fans may be as much as 30%. The reason is there are no dead spots to deal with and less back pressure. However, the maximum generated static pressure of the tubeaxial muffin fans remains at 7.62mm/0.3“ of H_2O.

Method C



System Cooling Method C

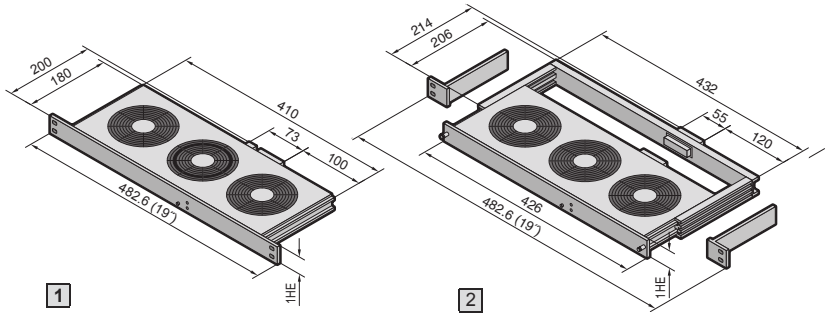
Method C is perhaps the most popular for VME solutions. However, it is not suitable when extensive rear panel I/O or CompactPCI rear mounted I/O boards are used.

Fan efficiency is approx 30%.

The RiCool Advantage Method D

The ability of the RiCool blower to generate 40.64mm/1.6” (H_2O) of static pressure confirms that the RiCool blower is able to provide effective cooling in densely packed enclosures and subracks. By comparison, a typical 19” rackmount fan tray, consisting of (3) 4.7” x 4.7” 18W (110CFM at free delivery) fans, generates only 0.22”-0.40” (H_2O) of static pressure. The estimated (operating) static pressure point of a fan assembly mounted inside a fully loaded subrack is 0.3-0.5” (H_2O). Under those conditions one RiCool blower assembly provides at least 40% higher airflow than a typical 19” rackmount fan tray with 3 tubeaxial muffin fans.

Rackmounted fan 482.6 mm (19”)



Rack-mounted fan/ Vario rack-mounted fan
supply includes:
Wired unit ready for connection, including terminal strip and assembly parts.

Guide frame supply includes:
Guide frame including connector and fitted connection cable (3 m), bracket for optional attachment to the 482.6 mm (19″) system, assembly parts.

! Also required:
Remember to order the appropriate guide frame for your chosen application.

	1 Rack-mounted fan module					2 Vario rack-mounted fan			
	Model No. SK					**Model No. SK**			
2 fans Distance between axes 85 mm	**3340.024**[1)]	**3340.115**[1)]	**3340.230**	–	–	**3350.024**[1)]	**3350.115**[1)]	**3350.230**	–
3 fans Distance between axes 85 mm	**3341.024**[1)]	**3341.115**	**3341.230**	–	**9769.002**[1)2)]	**3351.024**[1)]	**3351.115**[1)]	**3351.230**	–
3 fans Distance between axes 105 mm	**3342.024**	**3342.115**[1)]	**3342.230**	**3342.500**[2)3)]	–	**3352.024**[1)]	**3352.115**[1)]	**3352.230**	**3352.500**[1)3)]
Rated operating voltage V	24 V (DC)	115 V (AC)	230 V (AC)	24 V (DC) 115 – 230 V (AC)	36 V (DC) up to 72 V (DC)	24 V (DC)	115 V (AC)	230 V (AC)	24 V (DC) 115 – 230 V (AC)
Model No. SK matching guide frame	–	–	–	–	–	**3356.100**[1)]	**3355.100**	**3355.100**	**3357.100**[1)]

Accessories	Page									
Temperature indicator 230 V (AC)		3114.100	3114.115	3114.100	3114.024	–	3114.100	3114.115	3114.100	3114.024
Thermostat		3110.000								
Speed control		3120.000	3120.115	3120.000	–	–	3120.000	3120.115	3120.000	–

Technical specifications

Model No. SK/CS	**3340.230** **3350.230**	**3340.115** **3350.115**	**3340.024** **3350.024**	**3341.230** **3351.230** **3342.230** **3352.230**	**3341.115** **3351.115** **3342.115** **3352.115**	**3341.024** **3351.024** **3342.024** **3352.024**	**3342.500**[2)] **3352.500**[2)]	**9769.002**
Rated operating voltage V, Hz	AC 230 V 50/60 Hz	AC 115 V 50/60 Hz	DC 24 V –	AC 230 V 50/60 Hz	AC 115 V 50/60 Hz	DC 24 V –	DC 24 V AC 115 – 230 V 50/60 Hz	36 V (DC) up to 72 V (DC)
Rated current max.	0.24 A/ 0.22 A	0.46 A/ 0.46 A	0.49 A	0.36 A/ 0.33 A	0.69 A/ 0.69 A	0.74 A	0.85 A	0.28 A
Pre-fuse T	6.0 A							6.0 A
Number of fans	2			3				3
Air throughput, unimpeded air flow	320 m ^{3}/h			480 m^3/h				250 m^3/h
Temperature range	–10°C to +55°C							–33°C to +55°C
Noise level	51 dB (A)	52 dB (A)	51 dB (A)	51 dB (A)	52 dB (A)	51 dB (A)		52 dB (A)

[1)] Delivery times available on request.
[2)] Rack-mounted fan for metric mounting angles available on request.
[3)] Version with monitoring.

Cases, Subracks, & Rittal Brand Components

Instrumentation Cases

Pixus provides modular cases, sold as kits or assembled, for the electronics packaging of your instrumentation solution and specialty electronics. There are rackmount and desktop versions with a wide selection of configurations, sizes, and accessories utilizing Rittal brand enclosure components (including Vario, Kaparel, RiPac, and RiCase brands). Accessories include mounting kits, earthing kits, flanges for rackmount, feet, front handles, EMC gasketing, and panels.

Heat shortens the service life of equipment leading to failure, and also diminishes the high performance of electronics. The problem lies in high heat losses and compact installation spaces. Effective heat dissipation is therefore essential to ensure long service life and operational reliability.

As well as the components shown below, Pixus also offers a range of other 482.6 mm (19″) cooling systems and rack mounted fans.

Rittal Brand Components – Subracks & Components

Pixus offers the Rittal brand components for standard embedded boards, subracks, enclosures, cases, etc in individual piece parts. This includes rails, card guides, panels/handles, fillers, and much more.

Pixus Technologies Subrack Systems

EMC	U 1	2	3	4	5	6	7	9	Subracks	Design	Page
			■			■			Ripac Easy	aluminum	101
			■			■		■	Ripac Vario	aluminum	102
				■			■		Ripac Vario	aluminum	103
■			■			■		■	Ripac Vario EMC	aluminum	104
■				■			■		Ripac Vario EMC	aluminum	105
			■			■			Ripac Compact	aluminum	106
			■			■			Ripac Vario Mobil	aluminum	107

EMC	U 1	2	3	4	5	6	7	9	Subracks, individual components	Page
									Table of horizontal rails	108
			■	■		■	■	■	Side panels and flanges	110
									Horizontal rails	113

EMC	U 1	2	3	4	5	6	7	9	Subrack accessories	Page
	■	■	■	■		■	■	■	Components for EMC installation	124
						■		■	Mounting kits	126
									Guide rails	127
									Keying/PCB ejectors	132
									Covers	133
									Subrack climate control	88
									Front panels, handles	139
			■			■			Ripac box type plug-in units	156
									Assembly parts	159

Overview

Ripac EASY

For standard applications or demanding mechanical requirements
see page 101

Applications
Subrack system for standard applications or for high mechanical loads. Also suitable for applications requiring simple handling and fast assembly. Suitable for the installation of standardised PCBs or board type plug-in units up to 400 mm deep.

Design features
- 482.6 mm (19″) to IEC 60 297-3
- Height: 3 and 6U
- For board depth: 160 mm, 220 mm, 280 mm, 340 mm, 400 mm
- Fast, simple assembly thanks to pre-assembled screws and slots in the side panels
- Cover plates simply slide into place
- Horizontal rails with double screw-fastening
- Material: Aluminum, corrosion-resistant
- Mounting positions for horizontal rails on a 60 mm pitch pattern
- Horizontal rails at the rear with integral contact surface
- Installation of backplanes/midplanes or connectors
- Separate 482.6 mm (19″) gland plate

User benefits
- Simple, fast assembly thanks to pre-assembled screws
- Slide-in cover plates
- Horizontal rails with integral contact surface (no insulating strips required)
- Double screw-fastening of the horizontal rails ensures stability even under heavy loads

Ripac Vario

For standard applications or complex configurations
see pages 102-103

Applications
Subrack system for standard applications or complex configurations. Suitable for the installation of standardised PCBs or board type plug-in units up to 400 mm deep.

Design features
- 482.6 mm (19″) rack-mount system to IEC 60 297-3
- 3, 4, 6, 7 and 9U
- For board formats up to 400 mm deep
- Side panels of aluminum, clear-chromated
- Mounting positions for horizontal rails on a 10 mm pitch pattern
- Installation of backplanes/midplanes or connectors
- Separate 482.6 mm (19″) gland plate

User benefits
- Side panels with 10 mm pitch pattern of holes for variable system installation
- EMC upgradable
- 482.6 mm (19) gland plate may optionally be mounted on the front or rear
- Many size variants available as standard
- For backplane or connector mounting
- Extensive range of accessories

Ripac Vario EMC

For EMC applications and complex configurations
see pages 104-105

Applications
Subrack system for EMC applications or complex configurations. Suitable for the installation of standardised PCBs or board type plug-in units up to 400 mm deep.

Design features
- 482.6 mm (19″) EMC rack-mount system to IEC 60 297-3
- 3, 4, 6, 7 and 9U
- For board formats up to 400 mm deep
- Side panels of aluminum, clear-chromated
- Mounting positions for horizontal rails on a 10 mm pitch pattern
- Installation of backplanes/midplanes or connectors
- Separate 482.6 mm (19″) gland plate
- Including EMC springs

User benefits
- EMC version
- Side panels with 10 mm pitch pattern of holes for variable system installation
- 482.6 mm (19) gland plate may optionally be mounted on the front or rear
- Many size variants available as standard
- For backplane or connector mounting
- Extensive range of accessories

Overview

Ripac Compact

For mounting plates or top hat rails
see page 106

Applications
Subrack system for direct mounting in the enclosure. May optionally be mounted on a top hat rail or mounting plate. Suitable for the installation of standardised PCBs or board type plug-in units.

Design features
- Rack-mount system to IEC 60 297-3
- Prepared for mounting on top hat rails or directly on the mounting plate
- 3 and 6U
- For board formats up to 160 mm deep
- Installation width: 21 and 42 HP
- Side panels of aluminum, clear-chromated
- Installation of backplanes/midplanes

User benefits
- Direct mounting on mounting plates or rails
- Variable cable entry from below or above
- Side panels with 10 mm pitch pattern of holes for variable system installation
- For backplane mounting
- EMC version optional

Ripac Vario Mobil

For mobile applications
see page 107

Applications
Subrack system for use in rail vehicles. Suitable for the installation of standardised PCBs or board type plug-in units.

Design features
- 482.6 mm (19″) rack-mount system to IEC 60 297-3
- Tested to EN 50 155, 1996 (electronic equipment for rail vehicles)
- 3 and 6U
- For board formats up to 220 mm deep
- Side panels of aluminum, clear-chromated
- Installation of backplanes/midplanes or connectors
- Fully assembled

User benefits
- Suitable for use in rail vehicles
- EMC versions available
- Side panels with 10 mm pitch pattern of holes for variable system installation
- Fully assembled
- For backplane or connector mounting

Ripac Vario/Vario EMC

Complex applications thanks to numerous size variants and system accessories.

Depth-variable system installation is supported by the 10 mm pitch pattern of holes in the side panels.

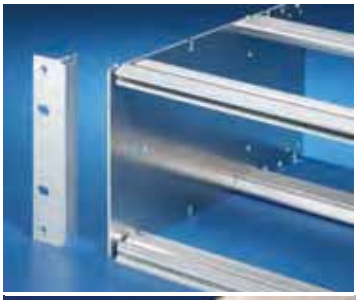
EMC shielding via horizontal and vertical EMC gaskets. Also suitable for retrofitting (with Ripac Vario).

Ripac Vario Mobil

- The subracks have been tested for use in the German national railway. Testing was conducted in accordance with standard EN 50 155, 1996 (electronic equipment in rail vehicles). The construction of the subracks tested conforms to IEC 48D.
- Vibration and shock-tested to: IEC 600-68-2-6, test Fc IEC 600-68-2-27, test Ea
- Supply includes: Subrack, fully assembled.

Ripac Compact

Subracks for mounting on mounting plates or top hat rails.



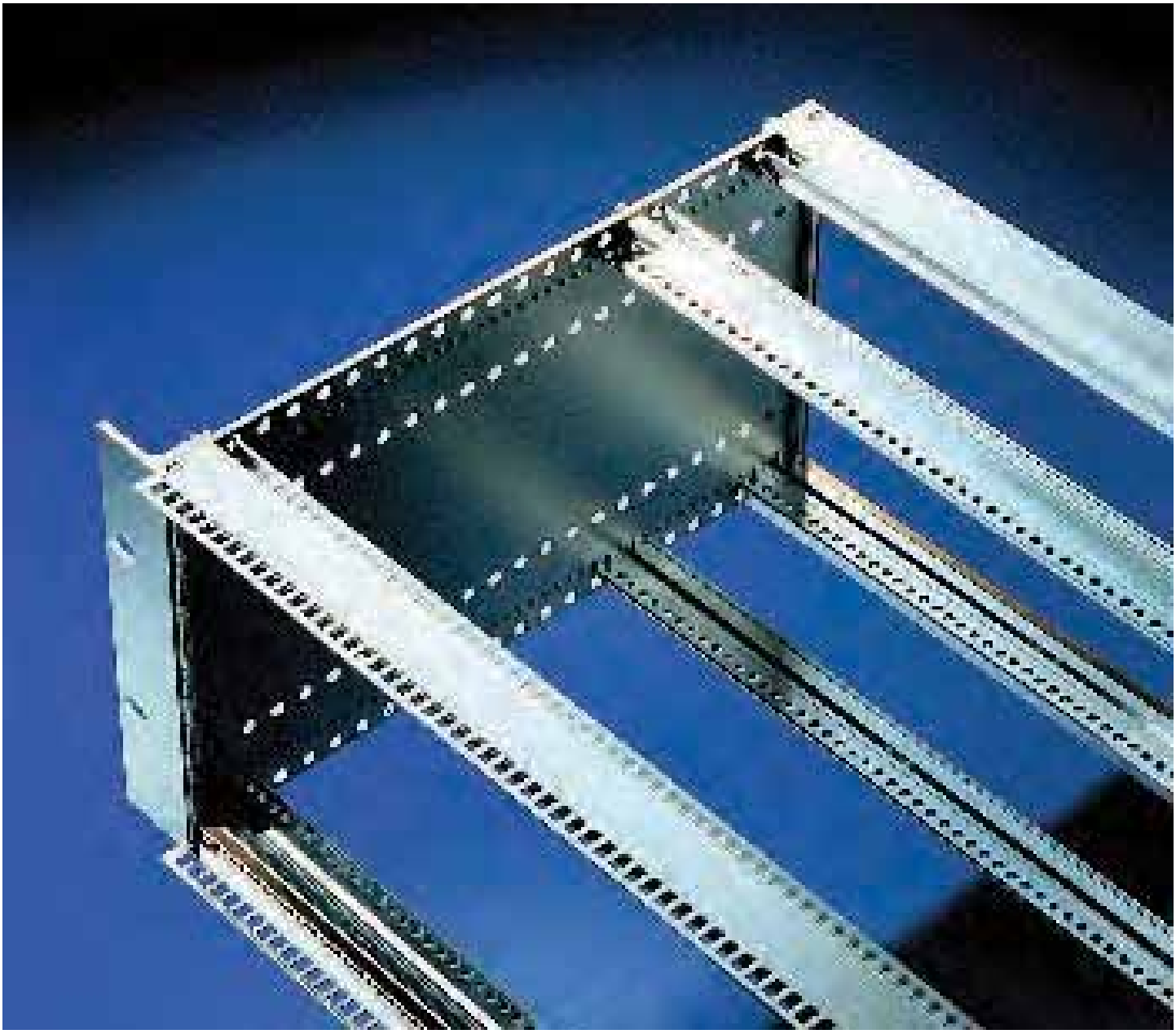
Ripac EASY

Simple handling thanks to pre-assembled screws. Double screw-fastening of the rails ensures safety even under heavy loads

Overview of benefits

- Modular subrack systems for individual configuration
- 5 basic versions for a variety of application areas
- Horizontal rails and accessories to fit all variants
- Prepared for or upgradable to EMC
- Fully assembled and wired on request
- Vibration and shock-tested

Ripac EASY



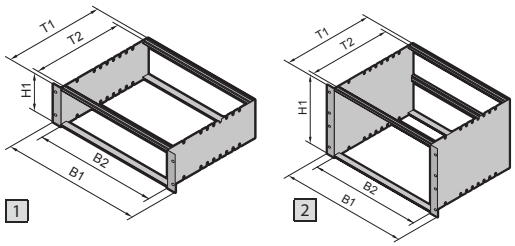
The modular concept of Ripac subracks facilitates a wide range of application options with a minimum of components.

All Ripac subracks are based on the same horizontal rails and system components.

The difference lies in the design of the side panels and installation options.

The subracks are shock and vibration-tested and comply with IEC 60 297-3-101, -102, -103.

Ripac EASY 3U, 6U



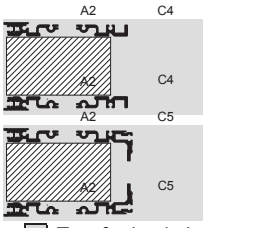
Material/Surface finish:
Side panels:
2 mm aluminum, corrosion-resistant
Horizontal rails:
Extruded aluminum section, corrosion-resistant
Flanges: Pre-anodized

Supply includes:
Side panels, flanges, horizontal rails, threaded inserts, assembly screws.
Rear horizontal rails (C4, C5) including prefitted assembly screws,
front horizontal rails (A2) including prefitted assembly screws and threaded inserts.

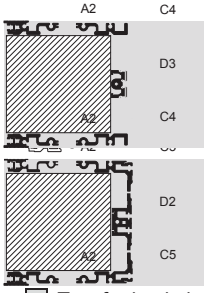
Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea

Standards:
Subracks are based on the system dimensions of IEC 60 297-3.

Note:
The backplanes may be fitted in direct contact with the rear horizontal rails.
No additional insulating strips are required.



1 Top: for backplane
Bottom: for connectors

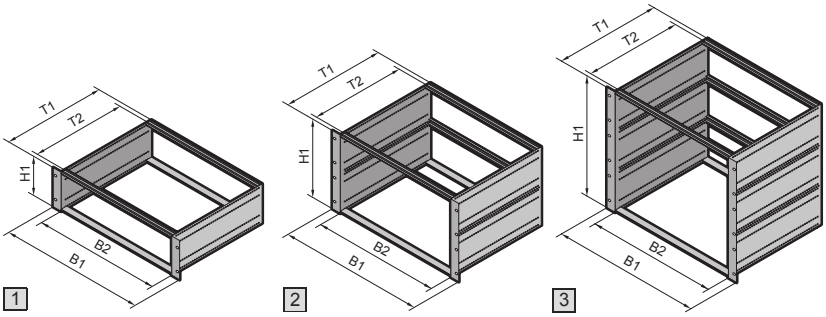


2 Top: for backplane
Bottom: for connectors

☑ Custom configuration available upon request.

					Model No. RP 1		Model No. RP 2		Page
U (H1)					3		6		
B1 mm	B2 HP	Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane	For connector IEC 60 603-2	For backplane	For connector IEC 60 603-2	
482.6 (19″)	84	175	160	160	3634.100	**3634.150**	**3634.180**	**3634.230**	
		235	220	220	**3634.110**	**3634.160**	**3634.190**	**3634.240**	
		295	280	280	**3634.120**	**3634.170**	**3634.200**	**3634.250**	
		355	340	340	**3634.130**	–	**3634.210**	–	
		415	400	400	**3634.140**	–	**3634.220**	–	
Accessories									
Covers									135
Horizontal rails									113
Guide rails									127

Ripac Vario 3U, 6U, 9U



EMC upgradable

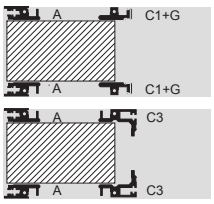
B = Width
H = Height
T = Depth

Material/Surface finish:
Side panels:
2.5 mm aluminum,
clear-chromated
482.6 mm (19″) flanges and
horizontal rails:
Extruded aluminum section,
clear-chromated

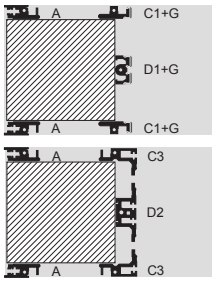
Supply includes:
Flanges, side panels, horizontal rails, threaded inserts, insulating strips or Z rails.

Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea

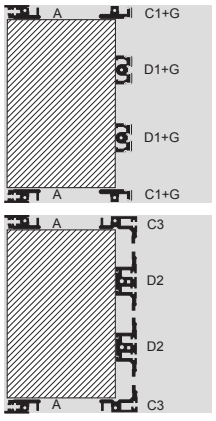
Standards:
Ripac subracks are based on the system dimensions of IEC 60 297-3.



1 Top: for backplane
Bottom: for connectors



2 Top: for backplane
Bottom: for connectors

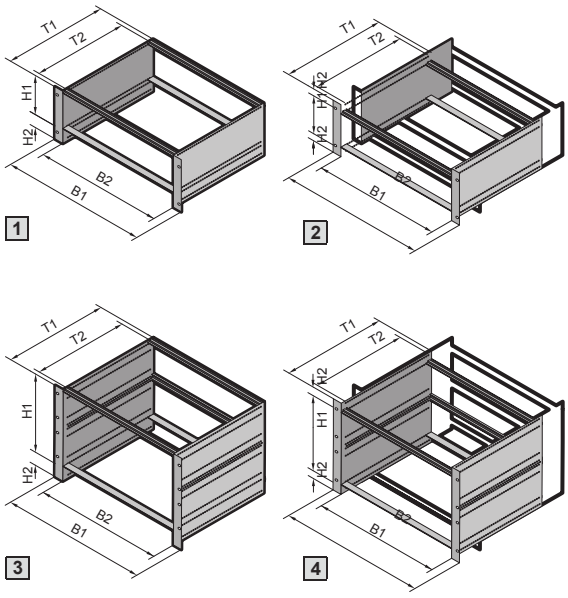


3 Top: for backplane
Bottom: for connectors

☑ Custom configuration available upon request.

					Model No. RP					
					1		2		3	
U					3	3	6	6	9	9
Height (H1) mm					132		265.35		398.70	
B1 mm	B2 HP	Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane	For connector IEC 60 603-2	For backplane	For connector IEC 60 603-2	For backplane	For connector IEC 60 603-2
482.6 (19″)	84	185	160	160	**3684.020**	**3684.034**	**3684.043**	**3684.056**	–	–
		225	200	160	**3684.021**	**3684.035**	**3684.044**	**3684.057**	–	–
		245	220	220	**3684.022**	**3684.036**	**3684.045**	**3684.058**	–	–
		285	260	220	**3684.023**	**3685.281**	**3684.046**	–	–	–
		305	280	280	**3685.231**	**3685.233**	**3685.238**	**3685.240**	–	–
		345	320	280	**3684.024**	–	**3684.047**	–	**3684.051**	**3684.059**
		365	340	340	**3685.232**	**3685.234**	**3685.239**	–	–	–
		405	380	340	**3684.025**	–	**3684.048**	–	**3684.052**	**3684.060**
		465	440	400	**3684.026**	–	**3684.049**	–	**3684.053**	**3684.061**
		525	500	400	**3684.027**	–	**3684.050**	–	**3684.054**	–
		585	560	400	–	–	–	–	**3684.055**	–

Ripac Vario 4U, 7U



B = Width
H = Height
T = Depth

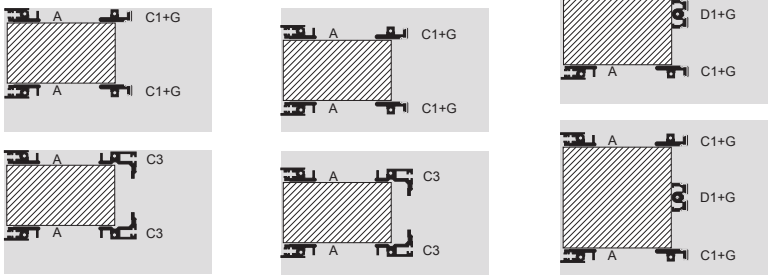
Material/Surface finish:
Side panels:
2.5 mm aluminum,
clear-chromated
482.6 mm (19″) flanges and
horizontal rails:
Extruded aluminum section,
clear-chromated

Supply includes:
Flanges, side panels, horizontal rails, threaded inserts, insulating strips or Z rails.

Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea

Standards:
Ripac subracks are based on the system dimensions of IEC 60 297-3.

EMC **upgradable**



1 Top: for backplane
Bottom: for connectors

2 Top: for backplane
Bottom: for connectors

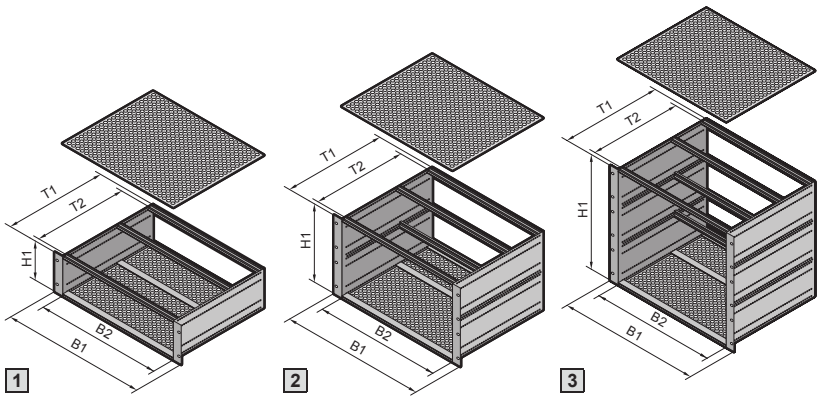
3 Top: for backplane (6U + 1U)

4 Bottom: for backplane (6U + 2 x $^1/_2$U)

☑ Custom configuration available upon request.

					Model No. RP					
					1		2		3	4
U (H1 + H2)					**4** (3 + 1)	**4** (3 + 1)	**4** (3 + 2 x $^1/_2$)	**4** (3 + 2 x $^1/_2$)	**7** (6 + 1)	**7** (6 + 2 x $^1/_2$)
B1 mm	B2 HP	Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane	For connector IEC 60 603-2	For backplane	For connector IEC 60 603-2	For backplane	For backplane
482.6 (19″)	84	245	220	220	**3685.235**	–	–	–	–	–
		285	260	220	**3684.028**	**3684.037**	**3684.031**	**3684.040**	–	–
		305	280	280	**3685.236**	–	–	–	–	–
		345	320	280	**3684.029**	**3684.038**	**3684.032**	**3684.041**	–	–
		365	340	340	**3685.237**	–	–	–	–	–
		405	380	340	**3684.030**	**3684.039**	**3684.033**	**3684.042**	**3684.064**	**3684.062**
		465	440	400	–	–	–	–	**3684.065**	**3684.063**

Ripac Vario EMC 3U, 6U, 9U



B = Width
H = Height
T = Depth

Material/Surface finish:
Side panels:
2.5 mm aluminum,
clear-chromated
Flanges and horizontal rails:
Extruded aluminum section,
clear-chromated
Covers: Aluminum, unplated

Supply includes:
Flanges, rear trim, side panels, EMC gaskets, covers, mounting blocks, horizontal rails, insulating strips.

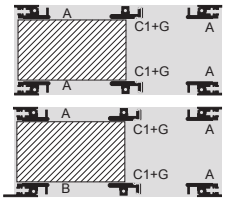
Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea

Standards:
Ripac subracks are based on the system dimensions of IEC 60 297-3.

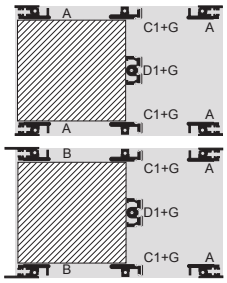
Detailed drawing,
see page 182.

EMC diagram,
see page 194.

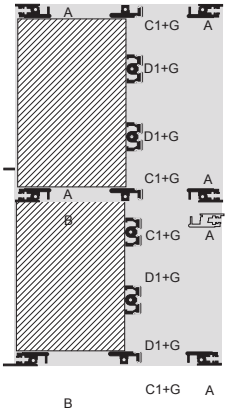
EMC



1
Top: for backplane
Bottom: for backplane/ front horizontal rail with 10 mm extension



2
Top: for backplane
Bottom: for backplane/ front horizontal rail with 10 mm extension

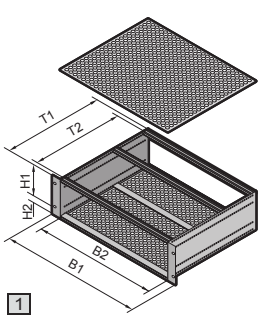


3
Top: for backplane
Bottom: for backplane/ front horizontal rail with 10 mm extension

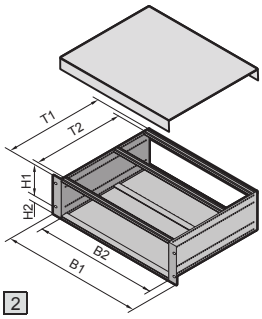
					Model No. RP 1		2		3	
U					**3**		**6**		**9**	
Height (H1) mm					132		265.35		398.70	
B1 mm	B2 HP	Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane	For backplane[1)]	For backplane	For backplane[1)]	For backplane	For backplane[1)]
482.6 (19″)	84	245	220	180	**3684.128**	**3684.142**	**3684.156**	**3684.169**	–	–
		285	280	220	**3684.129**	**3684.143**	**3684.157**	**3684.170**	–	–
		305	280	220	**3685.241**	**3685.243**	**3685.242**	**3685.244**	–	–
		345	320	280	**3684.130**	**3684.144**	**3684.158**	**3684.171**	**3684.162**	**3684.175**
		405	380	340	**3684.131**	**3684.145**	**3684.159**	**3684.172**	**3684.163**	**3684.176**
		465	440	400	**3684.132**	**3684.146**	**3684.160**	**3684.173**	**3684.164**	**3684.177**
		525	500	400	**3684.133**	**3684.147**	**3684.161**	**3684.174**	**3684.165**	**3684.178**
		585	560	400	–	–	–	–	**3684.166**	**3684.179**

[1)] Front horizontal rails with 10mm extension for injector/extractor handles (B)

Ripac Vario EMC 4U, 7U

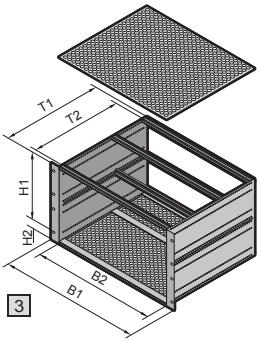


1

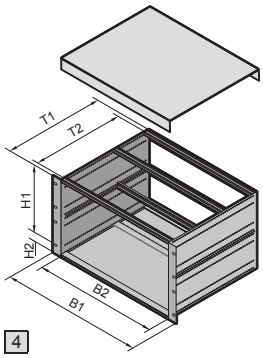


2

B = Width
H = Height
T = Depth



3



4

Material/Surface finish:
Side panels:
2.5 mm aluminum,
clear-chromated
Flanges and horizontal rails:
Extruded aluminum section,
clear-chromated
Covers: Aluminum, unplated

Supply Includes:
Flanges, rear trims, side panels, EMC gaskets, covers, mounting blocks, horizontal rails, threaded inserts, insulating strips.

Detailed parts lists,
see page 183.

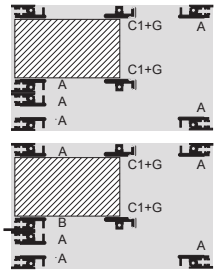
Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea

Standards:
Ripac subracks are based on the system dimensions of IEC 60 279-3.

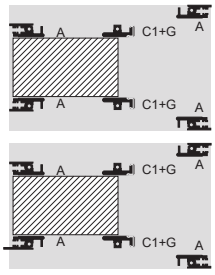
Detailed drawing,
see page 182.

EMC diagram,
see page 194.

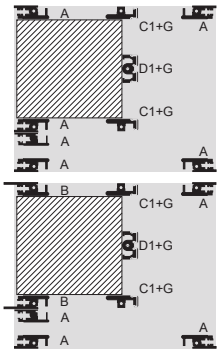
EMC



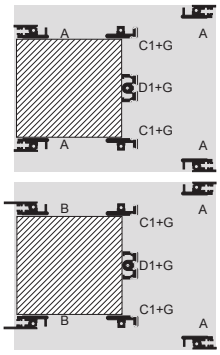
1
Top: for backplane
Bottom: for backplane/ front horizontal rail with 10 mm extension



2
Top: for backplane
Bottom: for backplane/ font horizontal rail with 10 mm extension



3
Top: for backplane
Bottom: for backplane/ front horizontal rail with 10 mm extension

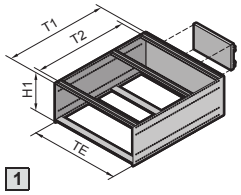


4
Top: for backplane
Bottom: for backplane/ front horizontal rail with 10 mm extension

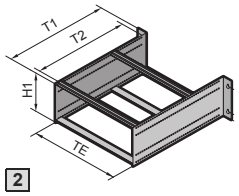
					Model No. RP							
					1		2		3		4	
U (H1 + H2)					4 (3 + 1)	4 (3 + 1)	4 (3 + 2 x 1/2)	4 (3 + 2 x 1/2)	7 (6 + 1)	7 (6 + 1)	7 (6 + 2 x 1/2)	7 (6 + 2 x 1/2)
B1 mm	B2 HP	Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane	For backplan[1)]	For backplane	For backplan[1)]	For backplane	For backplan[1)]	For backplane	For backplan[1)]
482.6 (19″)	84	285	260	220	**3684.134**	**3684.148**	**3684.137**	**3684.151**	**3684.187**	**3684.192**	–	–
		345	320	280	**3684.135**	**3684.149**	**3684.138**	**3684.152**	**3684.188**	**3684.193**	**3684.189**	**3684.196**
		405	380	340	**3684.136**	**3684.150**	**3684.139**	**3684.153**	**3684.180**	**3684.194**	**3684.190**	**3684.197**
		465	440	400	–	–	–	–	**3684.181**	**3684.195**	**3684.191**	**3684.198**

[1)] Front horizontal rails with 10mm extension for injector/extractor handles (B)

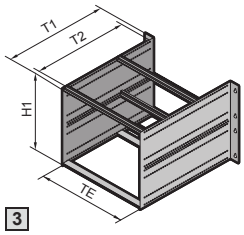
Ripac Compact 3U, 6U



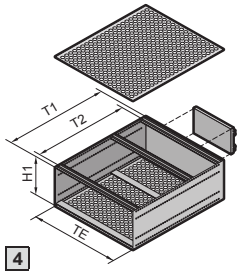
1



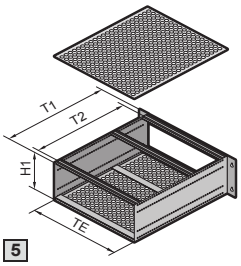
2



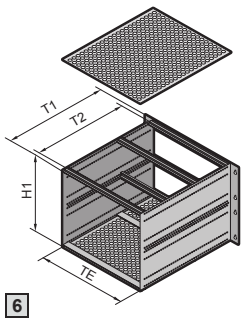
3



4



5



6

Material/Surface finish:
Side panels:
2.5 mm aluminum,
clear-chromated
Flanges and horizontal rails:
Extruded aluminum section,
clear-chromated

Supply includes:
Side panels, rear trims, flanges for mounting plates or top-hat rail adpters, EMC front/rear panels, EMC gaskets, covers, horizontal rails, threaded inserts, insulating strips.

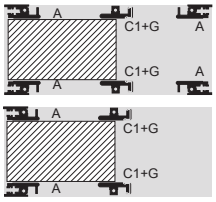
Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea

Standards:
Ripac subracks are based on the system dimensions of IEC 60 297-3.

B = Width
H = Height
T = Depth

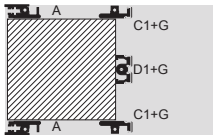
1 4
Ripac Compact 3 U
for top-hat rail

2 3 5 6
Ripac Compact 3 U
for mounting plate

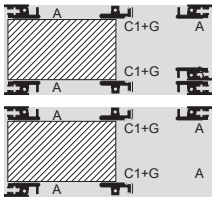


1 Top:
for top-hat rail

2 Bottom:
for mounting plate

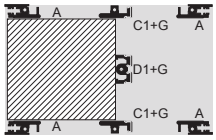


3 For mounting plate



4 Top: EMC for
top-hat rail

5 Bottom: EMC for
mounting plate



6 EMC for
mounting plate

☑ Custom configuration available upon request.

			Model No. RP					Model No. RP EMC				
			1	2	1	2	3	4	5	4	5	6
U			**3**	**3**	**3**	**3**	**6**	**3**	**3**	**3**	**3**	**6**
Height (H1) mm			132				265.35	132				265.35
HP			21	21	42	42	42	21	21	42	42	42
Attachment			Top-hat rail	Mounting plate	Top-hat rail	Mounting plate	Mounting plate	Top-hat rail	Mounting plate	Top-hat rail	Mounting plate	Mounting plate
Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane									
225	200	160	**3687.667**	**3687.669**	**3687.671**	**3687.673**	**3687.680**	**3687.682**	**3687.684**	**3687.686**	**3687.688**	**3687.690**
285	260	220	**3687.668**	**3687.670**	**3687.672**	**3687.674**	**3687.681**	**3687.683**	**3687.685**	**3687.687**	**3687.689**	**3687.691**

Ripac Vario Mobil 3U, 6U

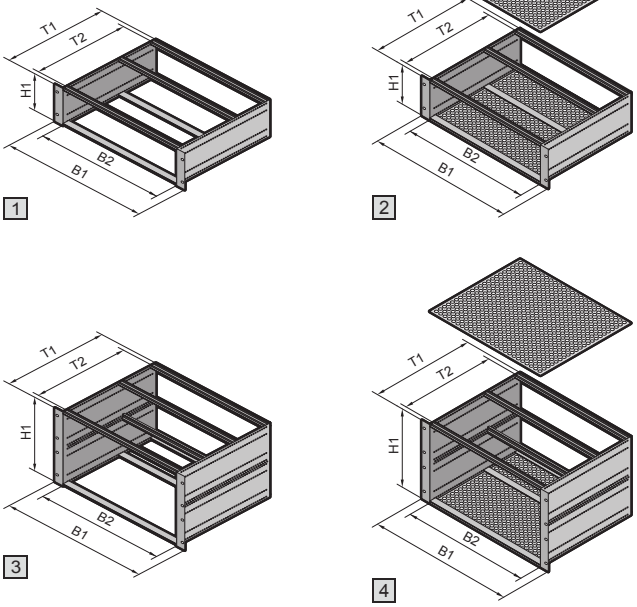
Material/Surface finish:
Side panels:
2.5 mm aluminum,
clear-chromated
482.6 mm (19″) flanges and
horizontal rails:
Extruded aluminum section,
clear-chromated
Covers: Aluminum, unplated

Supply includes:
Flanges, rear trims, side panels, EMC gaskets, covers, mounting blocks, horizontal rails, threaded inserts, insulating strips, fully assembled.

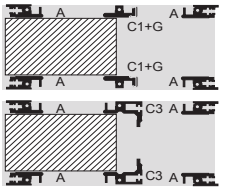
Tests:
Vibration and shock-tested to:
IEC 600-68-2-6 test Fc
IEC 600-68-2-27 test Ea
The subracks have been tested for use in the German national railway. Testing was conducted in accordance with standard EN 50 155, 1996 (Electronic Equipment in Rail Vehicles).
The configuration of the tested subracks conforms to IEC 48 D.

Standards:
Ripac subracks are based on the system dimensions of IEC 60 297-3.

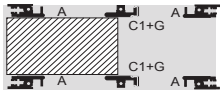
Note:
The subracks are supplied fully assembled.



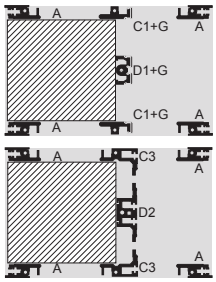
B = Width
H = Height
T = Depth



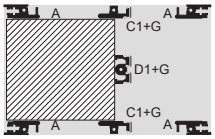
1 Top:
for backplane
Bottom:
for connector



2 EMC for backplane



3 Top:
for backplane
Bottom:
for connector



4 EMC for backplane

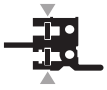
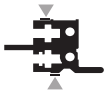
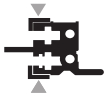
☑ Custom configuration available upon request.

					Model No. RP 1		Model No. RP EMC 2	Model No. RP 3		Model No. RP EMC 4
U					3	3	3	6	6	6
Height (H1) mm					132			265,35		
B1 mm	B2 HP	Side panel (T1) mm	T2 mm	Max. PCB depth mm	For backplane	For connector IEC 60 603-2	For backplane	For backplane	For connector IEC 60 603-2	For backplane
482.6 (19″)	84	245	220	220	**3687.782**	**3687.780**	**3687.784**	**3687.783**	**3687.781**	**3687.785**

Table of Horizontal Rails

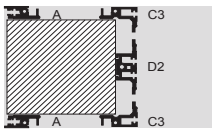
Ripac extrusion system: Complete, simple and easy to manage

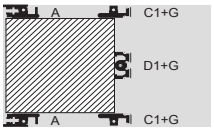
To fit all subrack systems as well as the Ripac Vario-Module instrument case/system enclosure range

Main sections / Additional sections	**A** Front horizontal rail	**A1** Front horizontal rail, double screw-fastening	**A2** Front horizontal rail, double screw-fastening (Ripac EASY)	**W (B)** Front horizontal rail, with 10 mm extension, for extractor handle type IV or VII	**B1** Double front horizontal rail, with 10 mm extension	**B2** Front horizontal rail, with 10 mm extension, double screw-fastening	**C1** Rear horizontal rail
							
E Rear adapter rail, center, to accommodate guide rails 	–	–	–	–	–	–	–
F Z rail for connector	–	–	–	–	–	–	
G Insulating strips [1] 	–	–	–	–	–	–	
H Conductive strips [1] 	–	–	–	–	–	–	
I Threaded insert							–
J Identification strips			–				
K EMC gaskets, horizontal			–				–

[1] For conductive or insulated attachment of backplanes.

All system requirements may be covered with just a few basic types of horizontal rail. A cost-effective, easy-to-manage range.





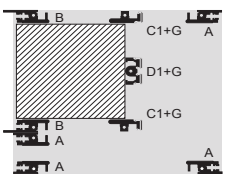
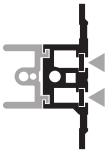


Table of Horizontal Rails

Ripac extrusion system: Complete, simple and easy to manage

To fit all subrack systems as well as the Ripac Vario-Module instrument case/system enclosure range

Main sections / Additional sections	**C3** Rear horizontal rail, with integral Z-rail	**C4** Rrear horizontal rail, double screw-fastening, for backplane mounting (Ripac EASY)	**C5** Rear horizontal rail, with integral Z-rail, double screw-fastening (Ripac EASY)	**C6** Rear horizontal rail, double screw-fastening	**D1** Rear horizontal rail, center	**D2** Rear horizontal rail, center, with integral Z-rail (also for Ripac EASY)	**D3** Rear horizontal rail, center, with integral contact surface (Ripac EASY)	**D4** Rear horizontal rail, for backplane mounting, double screw-fastening (Ripac EASY)
								
E Rear adapter rail, center, to acommodate guide rails 	–	–	–	–				–
F Z rail for connector	–	–	–			–	–	–
G Insulating strips[1] 	–	–	–			–	–	–
H Conductive strips[1]	–	–	–			–	–	–
I Threaded insert		–			–		–	
J Identification strips		–	–		–	–	–	–
K EMC gaskets, horizontal 	–	–	–	–	–	–	–	–

[1] For conductive or insulated attachment of backplanes.

Side Panels and Flanges

Side Panels

For Ripac Vario, Ripac Vario EMC, Ripac Compact, Ripac Vario Mobil
Mounting holes and anti-twist half-shears on a 10 mm pitch pattern.

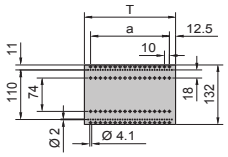
Material:
2.5 mm aluminum, clear-chromated

☑ Custom versions available upon request.

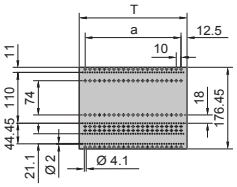
U			Model No. RP								
			3	4 (3 + 1)	4 (3 + 2 x 1/2)	6	7 (6 + 1)	7 (6 + 2 x 1/2)	9	10	11
D mm	a[1] mm	Packs of									
185	160	1	**3684.511**	–	–	**3684.529**	–	–	–	–	–
225	200	1	**3684.512**	**3685.793**	**3685.890**	**3684.530**	**3685.896**	**3685.893**	**3685.797**	–	–
245	220	1	**3684.513**	**3685.850**	**3685.891**	**3684.531**	**3685.897**	**3685.894**	–	–	–
285	260	1	**3684.514**	**3684.523**	**3684.526**	**3684.532**	**3685.743**	**3685.895**	–	–	–
305	280	1	**3684.515**	**3685.794**	–	**3684.533**	–	–	**3685.798**	–	–
345	320	1	**3684.516**	**3684.524**	**3684.527**	**3684.534**	**3685.744**	**3685.745**	**3684.547**	–	–
365	340	1	**3684.517**	**3685.795**	–	**3684.535**	–	–	**3685.799**	–	–
405	380	1	**3684.518**	**3684.525**	**3684.528**	**3684.536**	**3684.541**	**3684.543**	**3684.548**	**3684.545**	–
425	400	1	**3684.519**	–	–	**3684.537**	–	–	–	–	–
465	440	1	**3684.520**	**3685.796**	**3685.892**	**3684.538**	**3684.542**	**3684.544**	**3684.549**	**3684.546**	**3684.552**
525	500	1	**3684.521**	–	–	**3684.539**	**3685.898**	**3685.959**	**3684.550**	**3685.899**	**3684.553**
585	560	1	**3684.522**	–	–	**3684.540**	–	–	**3684.551**	–	**3684.554**

[1] a = Distance between the first and last mounting hole

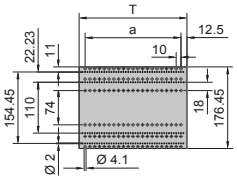
3U



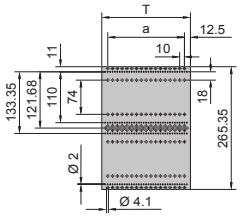
4U (3U + 1U)



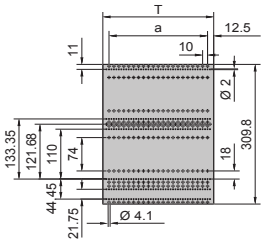
4U (3U + 2 x 1/2U)



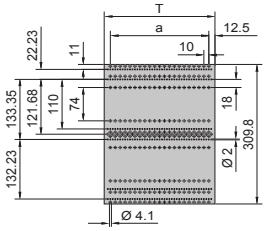
6U



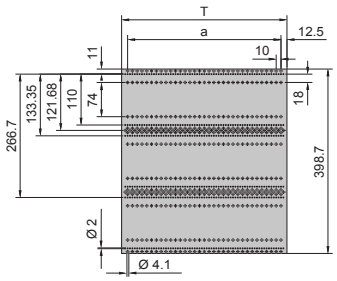
7U (6U + 1U)



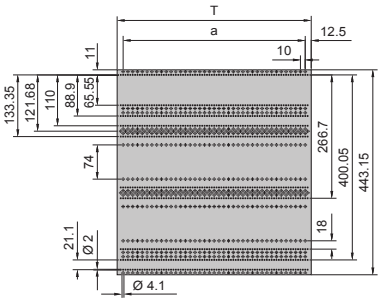
7U (6U + 2 x 1/2U)



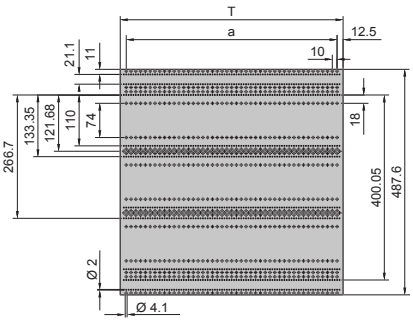
9U



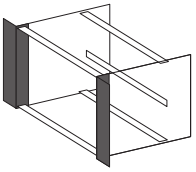
10U



11U



Side Panels and Flanges

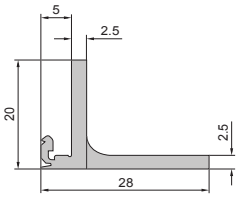


Flange
482.6 mm (19") flange

To fit all Ripac Vario, Ripac Vario EMC, Ripac Compact and Ripac Vario Mobil subracks. With integral channel to accommodate EMC gaskets.

Material:
Extruded aluminum section

Surface finish:
Clear-chromated

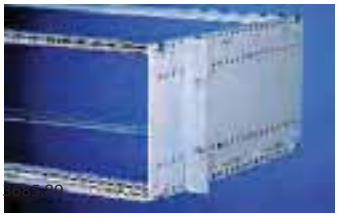


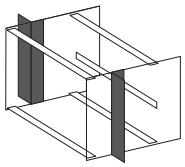
U	Packs of	Model No. RP	
		with handle holes	without handle holes
2	1	–	3684.614
3	1	**3684.622**	**3684.615**
4	1	**3684.623**	**3684.616**
6	1	**3684.624**	**3684.617**
7	1	**3684.625**	**3684.618**
9	1	–	**3684.619**
10	1	–	**3684.620**
11	1	–	**3684.621**

☑ Custom versions available upon request.

Accessories:

EMC gaskets, vertical,
see page 124.
Handles for subracks,
see page 112.



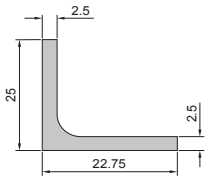


Flange
482.6 mm (19") flange

Recessed
To fit all Ripac Vario, Ripac Vario EMC and Ripac Vario Mobil subracks.

Material:
Extruded aluminum section

Surface finish:
Clear-chromated



U	Packs of	Model No.	RP
3	1	**3684.62**	**6**
4	1	**3684.62**	**7**
6	1	**3684.62**	**8**
7	1	**3684.62**	**9**
9	1	**3684.63**	**0**
10	1	**3684.63**	**1**
11	1	**3684.63**	**2**

☑ Custom versions available upon request.

! Also required:required:

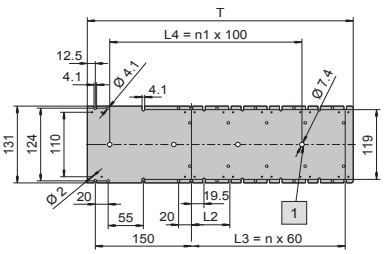
Assembly screws, nuts and washers.
Packs of 4 sets, Model No. RP 3687.015.
see page 160.

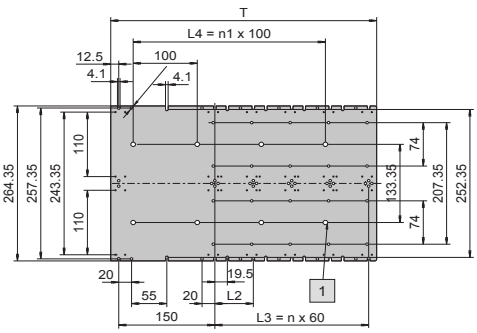
Side Panels
for Ripac EASY

- Mounting holes spaced 60 mm apart as slots
- Holes for telescopic slide mounting

Material:
1.5 mm aluminum, corrosion-resistant

D mm	L2	n	n1	Packs of	Max. PCB depth mm	Model No. RP	
						3U	6U
175	–	–	–	2	160	**3634.695**	**3634.720**
235	60	–	–	2	220	**3634.700**	**3634.725**
295	60	2	2	2	280	**3634.705**	**3634.730**
355	60	3	3	2	340	**3634.710**	**3634.735**
415	60	4	3	2	400	**3634.715**	**3634.740**





☑ Custom versions available upon request.

Accessories:

Flange for Ripac EASY.
see page 112.

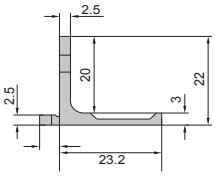
1

Side Panels and Flanges

Flange
482.6 mm(19")
for Ripac EASY
Integral holes for mounting handles.

Material:
Extruded aluminum section

Surface finish:
Anodized



U	Packs of	Model No. RP
3	2	**3634.745**
6	2	**3634.750**

Custom versions available upon request.

Accessories:

Handles for subracks.
see page 112.

Handles

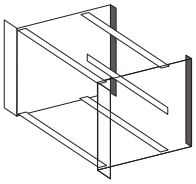
To fit all subracks and component shelves
For fitting on the subrack flange with handle holes and on all component shelves.

Material:
Die-cast zinc

Surface finish:
Spray-finished, silver-grey

Supply includes:
Assembly parts.

U	Packs of	Model No. RP
Subracks 3U and 4U	2	**3636.010**
Component shelves		
Subracks 6U and 7U	2	**3666.010**

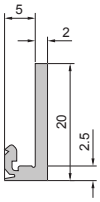


Trim section, rear

To fit all Ripac Vario, Ripac Vario EMC, Ripac Compact and Ripac Vario Mobil subracks.
Ensures 84 HP fit at the rear of the subrack.
With integral channel to accommodate EMC gaskets.

Material:
Extruded aluminum section

Surface finish:
Clear-chromated



U	Model No. RP	
	Packs of 1	Packs of 2
2	**3684.633**	–
3	**3684.634**	**3685.276**
4	**3684.635**	–
6	**3684.636**	**3685.277**
7	**3684.637**	–
9	**3684.638**	–
10	**3684.639**	–
11	**3684.640**	–

Custom versions available upon request.

Accessories:

EMC gaskets, vertical.
see page 124.

Pixus Technologies Page 112

Horizontal Rails

Front horizontal rail, double screw-fastening (A2)

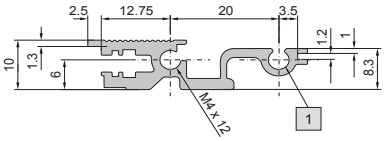
To accommodate guide rails and for the attachment of front panels.

- Pre-assembled screws M4 x 12 for fast mounting on the subrack side panel
- Front projection 2.5 mm corresponding to IEC 60 297-3
- Optional double screw-fastening ensures a high level of stability
- HP pitch pattern of holes for the precise installation of guide rails
- 1 x M4 thread on end face
- Straight-through core hole for optional second screw-fastening

Material:
Extruded aluminum section

Surface finish:
Corrosion-resistant

Supply includes:
2 horizontal rails with pre-assembled threaded inserts and screws M4 x 12.



1 Core hole M4

Usable width (HP)	Packs of	Model No. RP
84	2	**3634.600**

Custom lengths available upon request.

Accessories:

Assembly screws M4 x 12,
Model No. RP 3634.430 (packs of 100).

Note:
Additional assembly screws are required for double screw-fastening, Model No. RP 3634.430 (packs of 100).

Rear horizontal rail for backplane mounting, double screw-fastening (C4)

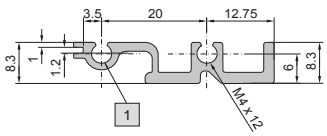
To accommodate guide rails and for direct mounting of backplanes.

- Pre-assembled screws M4 x 12 for fast mounting on the subrack side panel
- The mounting of insulating strips is not necessary, thanks to the integral contact surface
- Tapped holes M2.5 on a 1 HP pitch pattern for mounting backplanes
- HP pitch pattern of holes for the precise installation of guide rails
- Optional double screw-fastening ensures a high level of stability
- 1 x M4 thread on end face
- Straight-through core hole for optional second screw-fastening
- The height of the extrusion allows top-mounting with cover plates

Material:
Extruded aluminum section

Surface finish:
Corrosion-resistant

Supply includes:
1 horizontal rail with pre-assembled crews M4 x 12.



1 Core hole M4

Usable width (HP)	Packs of	Model No. RP
84	2	**3634.615**

Custom lengths available upon request.

Note:
Additional assembly screws are required for double screw-fastening, Model No. RP 3634.430 (packs of 100.).

Horizontal Rails for Ripac EASY

Rear horizontal rail, with integral Z-rail, double screw-fastening (C5)

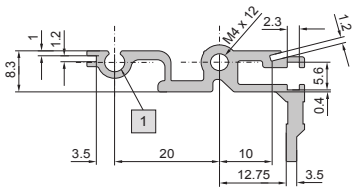
To accommodate guide rails, integral Z rail for mounting connectors.

- Pre-assembled screws M4 x 12 for fast mounting on the subrack side panel
- HP pitch pattern of holes for the precise installation of guide rails
- Optional double screw-fastening ensures a high level of stability
- 1 x M4 thread on end face
- Straight-through core hole for optional second screw-fastening
- The height of the extrusion allows top-mounting with cover plates

Material:
Extruded aluminum section

Surface finish:
Corrosion-resistant

Supply includes:
2 horizontal rail with pre-assembled screws M4 x 12.



1 Core hole M4

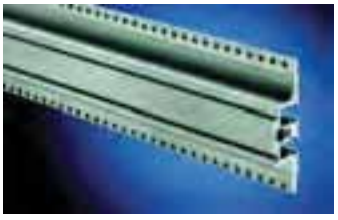
Usable width (HP)	Packs of	Model No. RP
84	2	**3634.620**

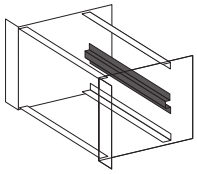
☑ Custom lengths available upon request.

Accessories:

Threaded inserts,
Model No. RP 9901.816 (packs of 1).
see page 122.

Note:
Additional assembly screws are required for double screw-fastening, Model No. RP 3634.430 (packs of 100).





Rear horizontal rail, center, with integral Z-rail (D2)

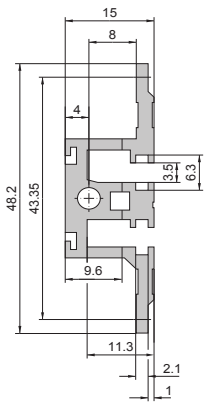
When using 6 U PCBs or box-type plug-in units. Integral Z rail for mounting connectors to IEC 60 603-2.

- 84 tapped holes M2.5
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Corrosion-resistant

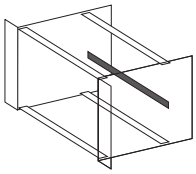
Supply includes:
1 horizontal rail,
2 assembly screws.



Usable width (HP)	Packs of	Model No. RP
84	1	**3634.085**

☑ Custom lengths available upon request.

Horizontal Rails for Ripac EASY



Rear horizontal rail, center (D3) for backplane mounting

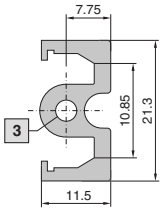
When using 6U PCBs or box-type plug-in units.
For mounting backplanes.

- 84 tapped holes M2.5
- M4 thread on end face
- Straight-through core hole
- The mounting of insulating strips is not necessary, thanks to the integral contact surface

Material:
Extruded aluminum section

Surface finish:
Corrosion-resistant

Supply includes:
1 horizontal rail,
2 assembly screws.



Usable width (HP)	Packs of	Model No. RP
84	1	**3634.045**

☑ Custom lengths available upon request.

Rear horizontal rail, for rear panel mounting

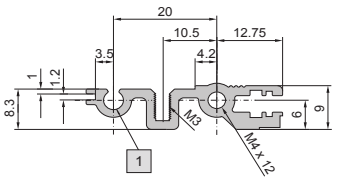
For the attachment of rear front panels.

- Optional double screw-fastening ensures a high level of stability
- With screw channel for roof plate attachment
- 1 x M4 thread on end face
- Straight-through core hole for optional second screw-fastening
- Pre-assembled screws M4x12 for fast mounting on the subrack side panel

Material:
Extruded aluminum section

Surface finish:
Corrosion-resistant

Supply includes:
2 horizontal rails with pre-assembled threaded inserts and screws.



1 Core hole M4

Usable width (HP)	Packs of	Model No. RP
84	1	**3634.510**

☑ Custom lengths available upon request.

Accessories:

Assembly screws M4 x 12,
Model No. RP 3634.430 (packs of 100).

Note:
Additional assembly screws are required for double screw-fastening,
Model No. RP 3634.430 (packs of 100).

Threaded inserts for Ripac EASY

With M2.5 threaded holes on an HP pitch pattern.

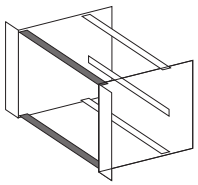
- For sliding into the front horizontal rails (A2) and rear horizontal rails (D4, C5)
- Size: 5 x 2 mm

Material:
Sheet steel, zinc-plated

Usable width (HP)	Packs of	Model No. RP
84	1	**9901.816**

☑ Custom lengths available upon request.

Horizontal Rails



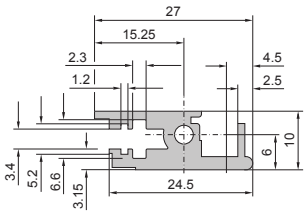
Front horizontal rail (A)

To accommodate guide rails and for the attachment of front panels.

- Front projection 2.5 mm corresponding to IEC 60 297-3
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole
- Horizontal rail 192 HP without machining on the end faces. Suitable for cutting to length

Material:
Extruded aluminum section

Surface finish:
Clear-chromated or anodized



Usable width (HP)	Packs of	Model No. RP
4 (left)	1	**3684.592**
4 (right)	1	**3684.955**
8 (left)	1	**3684.593**
8 (right)	1	**3684.956**
12	1	**3684.594**
16	1	**3684.595**
20	1	**3684.596**
21	1	**3685.985**
40	1	**3684.960**
42	1	**3684.560**
63	1	**3684.561**
84	1	**3684.562**
84	2	**3685.267**[1)]
192	1	**3688.000**[2)]

[1)] Including 4 assembly screws
[2)] Anodized

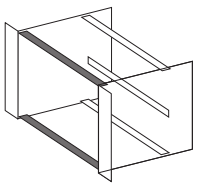
☑ Custom lengths available upon request.

Also required:

Assembly screws M4 x 12
packs of 100, Model No. RP 3654.300.
see page 159.

Accessories:

Threaded inserts (packs of 1).
see page 122.



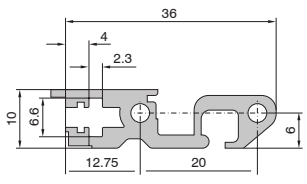
Front horizontal rail, with double screw-fastening (A1)

To accommodate guide rails and for the attachment of front panels. The double screw-fastening ensures a high level of stability even under extreme loads.

- Load test to DIN EN/IEC 61 587-1, requirement level SL1
- Shock and vibration tests undertaken as per IEC 61 373 (DIN EN 50 155), Category 1, Class B
- Front projection 2.5 mm corresponding to IEC 60 297-3-101
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Clear-chromated



Usable width (HP)	Packs of	Model No. RP
84	1	**9908.721**

☑ Custom lengths available upon request.

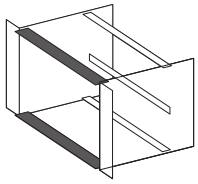
Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Accessories:

Threaded inserts, Model No. RP 3684.610.
see page 122.

Horizontal Rails



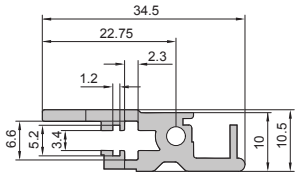
Front horizontal rail, with 10 mm extension (B)

for type IV, IVs and VII injector/extractor handle
To accommodate guide rails and for the attachment of front panels.

- Front projection and pitch pattern of holes based on IEEE 1101.10 and IEC 60 297-3-101, for the use of injector/extractor handles type IV and VII
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole
- Horizontal rail 192 HP without machining on the end faces. Suitable for cutting to length

Material:
Extruded aluminum section

Surface finish:
Clear-chromated or anodized



Usable width (HP)	Packs of	Model No. RP
40	1	**3684.961**
42	1	**3684.565**
63	1	**3684.566**
84	1	**3684.567**
84	2	**3685.269**[1)]
192	1	**3688.001**[2)]

[1)] Including 4 assembly screws
[2)] Anodized

Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Accessories:

Threaded inserts (packs of 1).
see page 122.

Double front horizontal rail, with 10 mm extension (B1) - Version 1

To accommodate guide rails and for the attachment of front panels.

- Front projection and pitch pattern of holes based on IEEE 1101.10 and IEC 60 297-3-101, for the use of injector/extractor handles type IV and VII
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

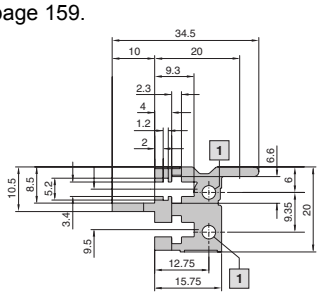
Surface finish:
Clear-chromated

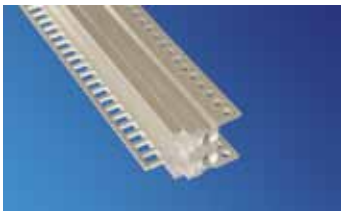
Usable width (HP)	Packs of	Model No. RP
84	1	3687.724

Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.





Double front horizontal rail, with 10 mm extension (B1) - Version 2

To accommodate guide rails and for the attachment of front panels.

- Front projection and pitch pattern of holes based on IEEE 1101.10 and IEC 60 297-3-101, for the use of injector/extractor handles type IV and VII
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

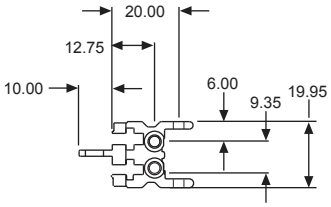
Surface finish:
Clear-chromated

Usable width (HP)	Packs of	Model No. RP
84	1	3688.704

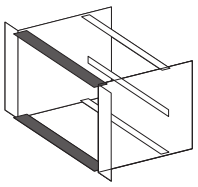
Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.



Horizontal Rails



Front horizontal rail, with 10 mm extension (B2), with double screw-fastening

for type IV, IVs and VII injector/extractor handle To accommodate guide rails and for the attachment of front panels. The double screw-fastening ensures a high level of stability even under extreme loads.

- Load test to DIN EN/IEC 61 587-1, requirement level SL1
- Shock and vibration tests undertaken as per IEC 61 373 (DIN EN 50 155), Category 1, Class B
- Front projection and pitch pattern of holes based on IEC 60 297-3-101, for the use of injector/extractor handles type IV and VII
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Clear-chromated

Usable width (HP)	Packs of	Model No. RP
84	1	**9908.722**

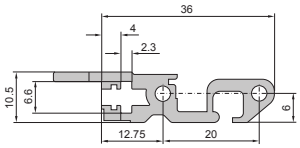
Custom lengths available upon request.

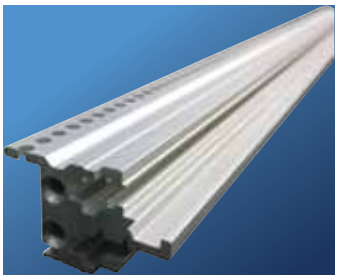
Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Accessories:

Threaded inserts, Model No. RP 3684.610
(packs of 1).
see page 122.





Front Rail 84HP Type (B4) VPX *

For Type IVs or Type VII metal handles.
To accommodate guide rails and for the attachment of front panels.

- Load test to DIN EN/IEC 61 587-1, requirement level SL1
- Shock and vibration tests undertaken as per IEC 61 373 (DIN EN 50 155), Category 1, Class B
- Front projection and pitch pattern of holes based on IEC 60 297-3-101, for the use of injector/extractor handles type IVs and VII
- HP pitch pattern of holes for the precise installation of guide rails
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Clear-chromated

Description	Length	Model Number
Front Rail Type B4 VPX	84HP	PMP00003

Custom lengths available upon request.

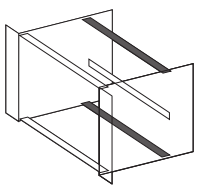
Also required:

Assembly screws M4 x 12, packs of 100,
Model No. RP 3654.300.
See pg 159

Accessories:

Threaded inserts, Model No. RP 3684.610 (packs of 1). 36 2.3 4 12.75 20 6.6 10.5 6 Usable width (HP) Packs of Model No. RP 84 1 9908.722

* Not sold individually



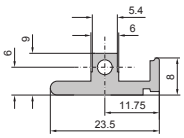
Rear horizontal rail (C1)

To accommodate guide rails and for the attachment of Z rails, insulating strips or conductive strips and backplanes.

- Tapped holes M2.5 on a 1 HP pitch pattern
- HP pitch pattern of holes for the precise installation of guide rails
- M2.5 thread for the installation of Z rails or backplanes
- M4 thread on end face
- Straight-through core hole
- Horizontal rail 192 HP without machining on the end faces. Suitable for cutting to length

Material:
Extruded aluminum section

Surface finish:
Clear-chromated or anodized



Usable width (HP)	Packs of	Model No. RP
21	1	**3685.991**
40	1	**3684.962**
42	1	**3684.570**
63	1	**3684.571**
84	1	**3684.572**
84	2	**3685.268**[1)]
192	1	**3688.002**[2)]

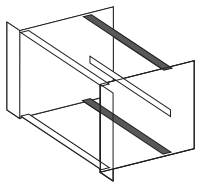
[1)] Including 4 assembly screws
[2)] Anodized

Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Horizontal Rails



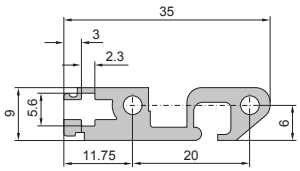
Rear horizontal rail, with double screw-fastening (C6)

To accommodate guide rails and for the attachment of Z rails, insulating strips or conductive strips and backplanes. The double screw-fastening ensures a high level of stability even under extreme loads.

- Load test to DIN EN/IEC 61 587-1, requirement level SL1
- Shock and vibration tests undertaken as per IEC 61 373 (DIN EN 60,155), Category 1, Class B
- Tapped holes M2.5 on an HP pitch pattern
- HP pitch pattern of holes for the precise installation of guide rails
- M2.5 thread for the installation of Z rails or backplanes
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Clear-chromated or anodized



Usable width (HP)	Packs of	Model No. RP
84	1	**9908.723**

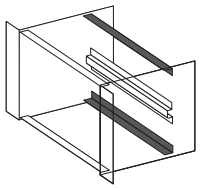
☑ Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Accessories:

Threaded inserts, Model No. RP 9901.816
(packs of 2).
see page 122.



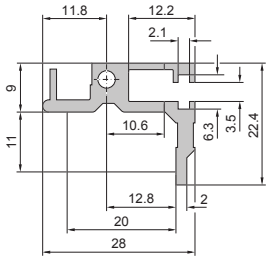
Rear horizontal rail, with integral Z rail (C3)

To accommodate guide rails. Integral Z rail for mounting connectors to IEC 60 603-2.

- HP pitch pattern of holes for the precise installation of guide rails
- 84 tapped holes M2.5 for connector mounting
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Clear-chromated



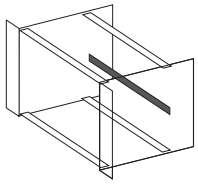
Usable width (HP)	Packs of	Model No. RP
42	1	**3686.191**
63	1	**3686.919**
84	1	**3686.159**

☑ Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300,
see page 159.

Horizontal Rails



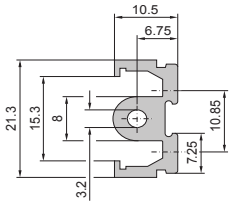
Rear horizontal rail, center (D1)

When using 6U PCBs or box-type plug-in units. Facility for the attachment of Z rails, insulating strips or conductive strips.

- 84 tapped holes M2.5
- M4 thread on end face
- Straight-through core hole
- Horizontal rail 192 HP for cutting to the required length

Material:
Extruded aluminum section

Surface finish:
Clear-chromated or anodized



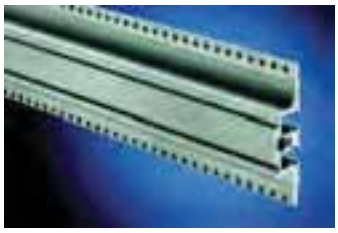
Usable width (HP)	Packs of	Model No. RP
40	1	**3684.963**
42	1	**3684.580**
63	1	**3684.581**
84	1	**3684.582**
84	1	**3685.270**[1)]
858.5 mm	1	**3684.579**
192	1	**3688.003**[2)]

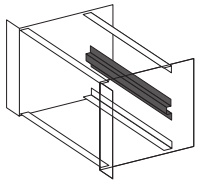
[1)] Including 2 assembly screws
[2)] Anodized

☑ Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.





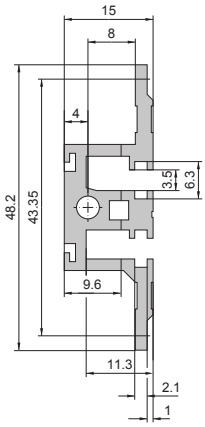
Rear horizontal rail, center, with integral Z rail (D2)

When using 6U PCBs or box-type plug-in units. Integral Z rail for mounting connectors to IEC 60 603-2.

- 84 tapped holes M2.5
- M4 thread on end face
- Straight-through core hole

Material:
Extruded aluminum section

Surface finish:
Clear-chromated



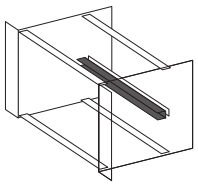
Usable width (HP)	Packs of	Model No. RP
42	1	**3687.600**
63	1	**3687.601**
84	1	**3687.602**
858.5 mm	1	**3687.603**

☑ Custom lengths available upon request.

Also required:

Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Horizontal Rails



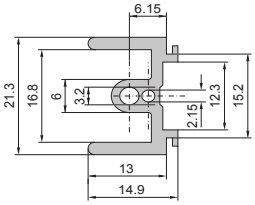
Rear horizontal rail, center (E)

When subdividing 6U into 2 x 3U, the adapter rail accommodates the guide rails when fastened to the center horizontal rail.

- HP pitch pattern of holes for the precise installation of guide rails
- M4 and M2.5 thread on the end face
- Straight-through core hole
- Horizontal rail 192 HP without machining on the end faces. Suitable for cutting to length

Material:
Extruded aluminum section

Surface finish:
Clear-chromated or anodized



Usable width (HP)	Packs of	Model No. RP
12	1	**3684.587**
16	1	**3684.588**
20	1	**3684.589**
40	1	**3684.964**
42	1	**3684.590**
63	1	**3686.005**
84	1	**3684.591**
84	1	**3685.272**[1)]
858.5 mm	1	**3684.584**
192	1	**3688.004**[2)]

[1)] Including 2 assembly screws
[2)] Anodized

☑ Custom lengths available upon request.

Also required:

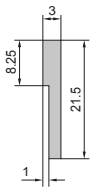
Assembly screws M4 x 12,
packs of 100, Model No. RP 3654.300.
see page 159.

Z rail for connector IEC 60 603-2 (F)

With 84 x M2.5 threaded holes.

Material:
Extruded aluminum section

Surface finish:
Clear-chromated



Usable width (HP)	Packs of	Model No. RP
4	1	**3684.597**
8	1	**3684.598**
20	1	**3684.599**
40	1	**3684.965**
42	1	**3684.600**
63	1	**3684.601**
84	1	**3684.602**
84	2	**3685.271**

☑ Custom lengths available upon request.

Also required:

Assembly screws M2.5 x 6,
packs of 100, Model No. RP 3654.340.
see page 159.

Horizontal Rails

Threaded insert (I)

With M2.5 threaded holes on an HP pitch pattern. For sliding into the horizontal rail. There are two threaded insert versions, which are distinguished by their height.

Material:
Sheet steel, zinc-plated

Usable width (HP)	Packs of	Model No. RP	
		6 x 2 mm	5 x 2 mm
		for horizontal rails	
		Type A, A1, B, B1, B2, C3	Type A2, C5, C6, D4
4	1	**3684.603**	–
8	1	**3684.604**	–
12	1	**3684.605**	–
16	1	**3684.606**	–
20	1	**3684.607**	–
21	1	**3686.149**	–
40	1	**3684.966**	–
42	1	**3684.608**	–
63	1	**3684.609**	–
84	1	**3684.610**	**9901.816**

☑ Custom lengths available upon request.

Threaded insert 6mm 84HP VPX *

Threaded inserts for VPX Rails. With M2.5 threaded holes on an HP pitch pattern.
* Special OpenVPX offset spacing

- For sliding into the VPX front horizontal rails (B4)
- Size: 6 x 2 mm

Material:
Sheet steel, zinc-plated

Usable width	Packs of	Model No.
84HP	1	PMP00004

* Not sold individually

Identification strip (J)

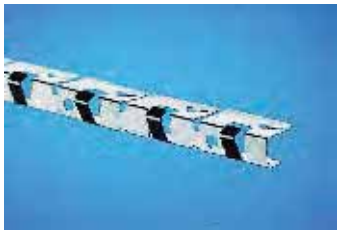
To identify the slots on the subrack, self-adhesive. The following versions are available.

4 mm wide:
- for horizontal rails
- for rear horizontal rails

2 mm wide:
- for front horizontal rails (channel on front face)

For horizontal rail	Width mm	Label	Packs of	**Model No. RP**
Front	4	1 ... 84	1	**3687.575**
Rear	4	1 ... 168	1	**3687.577**
Front	4	84 ... 1	1	**3687.574**
Front	2	1 ... 84	1	**3687.576**

☑ Custom lengths available upon request.



EMC gaskets, horizontal (K)

see page 125.

Conductive strip (H)

For conductive mounting of backplanes.

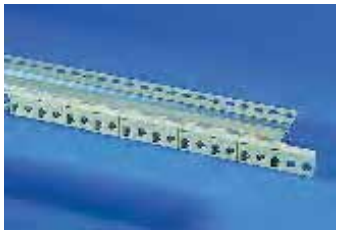
- 84 HP
- Slides onto the rear horizontal rail

Material:
Aluminum

Usable width (HP)	Packs of	**Model No. RP**
84	1	**3684.612**
84	2	**3685.273**

☑ Custom lengths available upon request.

Horizontal Rails



Insulating strip (G)

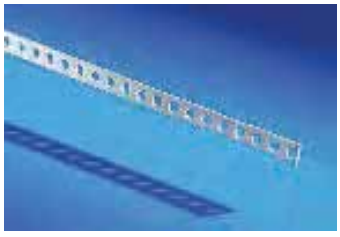
For insulated mounting of backplanes.

- 21 HP
- Can be shortened (4 x 4HP segments 1 x 5HP segment).
- Slides onto the rear horizontal rail

Material:
Plastic, self-extinguishing to UL 94-V0

Usable width (HP)	Packs of	Model No. RP
21	1	**3684.611**
21	8	**3685.274**

Rear horizontal rail, center, fitted with insulating strips (top) and conductive strips (bottom).



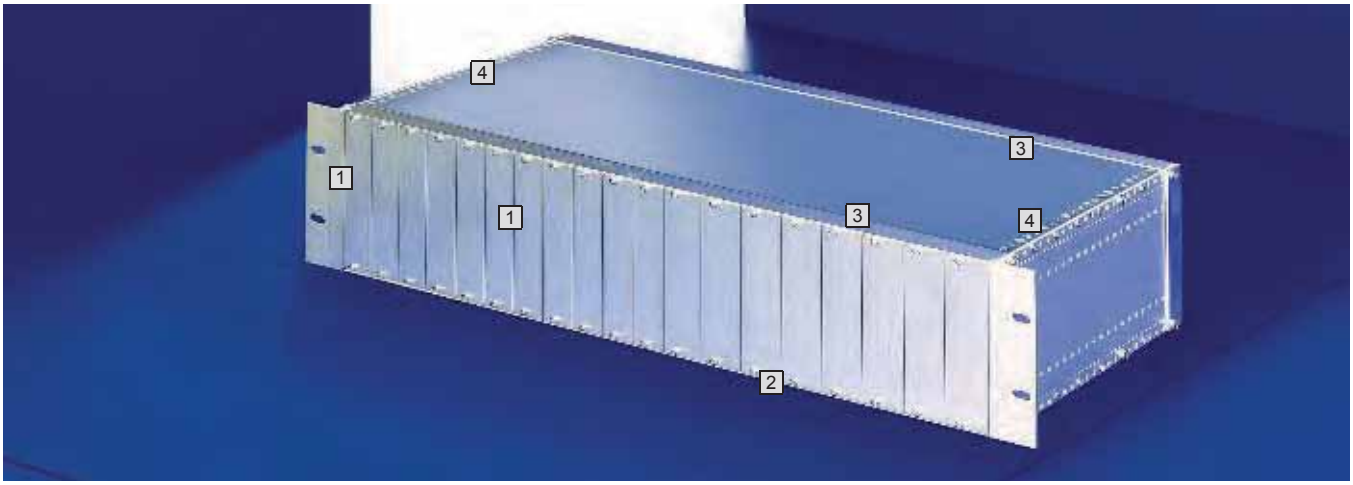
Punched strip

Material:
Aluminum

Usable width (HP)	Packs of	Model No. RP
84	2	**3685.275**

☑ Custom lengths available upon request.

Components for EMC Installation

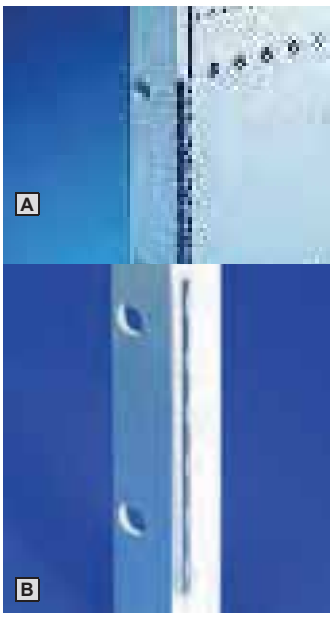


EMC (electromagnetic compatibility) refers to the ability of an electrical device to function satisfactorily in its electromagnetic environment without influencing or being influenced by this environment more than is admissible.

These requirements were taken into account when developing the Rittal subracks. They are made entirely from metal and coated with a conductive surface finish.

Stainless steel EMC gaskets ensure conductive connection of the separate parts.

1 EMC gaskets, vertical
2 EMC gaskets, horizontal
3 EMC gaskets for covers
4 Mounting blocks



EMC gaskets, vertical

To ensure EMC protection between the subrack side panel and the front/rear panels. There are two versions available.

Suitable for mounting on:
- 482.6 mm (19″) flanges for subracks
- Corner trims, rear
- EMC contact strip
- U-channel front panels
- Trim panels for Ripac Vario-Module
- Flanges for Ripac Vario-Module

Material:
Stainless steel

German patent
no. 101 15 525 and
no. 198 46 627
US patent no. 6,500,012
US patent no. 7,044,753

EMC

A Version 1: Segmented

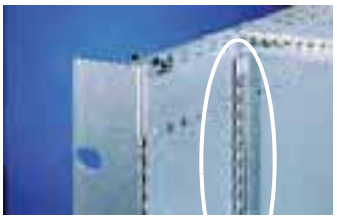
U	Model No. RP Packs of 1	Model No. RP Packs of 10
1	**3686.973**	**3684.236**
2	**3686.974**	**3684.237**
3	**3686.975**	**3684.238**
4	**3686.976**	**3684.239**
6	**3686.977**	**3684.240**
7	**3686.978**	**3684.241**
9	**3686.979**	**3684.242**
10	**3686.980**	**3684.243**
11	**3686.981**	**3684.244**

☑ Custom lengths available upon request.

B Version 2: One-piece

U	Model No. RP Packs of 1
2	**3688.610**
3	**3688.611**
4	**3688.612**
5	**3688.613**
6	**3688.614**
7	**3688.615**
8	**3688.634**
9	**3688.616**
10	**3688.609**
11	**3688.633**
12	**3688.606**

Components for EMC Installation

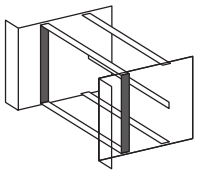


EMC contact strip

To ensure EMC protection when horizontal rails are set-back. Integral channel to accommodate EMC gaskets.

Material:
Extruded aluminum section, clear-chromated

Note:
2 sections are required for each subrack.



EMC

U	Packs of	Model No. RP
3	1	**3684.643**
6	1	**3684.644**
9	1	**3684.645**

☑ Custom lengths available upon request.

Also required:

EMC gaskets, vertical.
Assembly screws M3 x 6, packs of 100.
Model No. RP 3684.233.
see page 159.

EMC gaskets, horizontal (K)

For horizontal EMC protection. For snap-fastening onto the front horizontal rails.

Material:
Stainless steel

European patent no. 0 937 375
with validity for DE
US patent no. 6,137,052
Chinese patent
no. ZL 97 1 98582.0

EMC

Usable width (HP)	Packs of	Model No. RP
For top/bottom horizontal rail		
40	1	**3684.974**
84	1	**3684.808**
84	10	**3684.246**
For sub-division of 6 U into 2 x 3 U, between 2 horizontal rails		
84	1	**3685.789**
84	10	**3685.229**

☑ Custom lengths available upon request.

EMCgaskets

for covers
For EMC shielding between the horizontal rails and covers.

Material:
Stainless steel

EMC

HP	Packs of	Model No. RP
84	10	**3684.245**

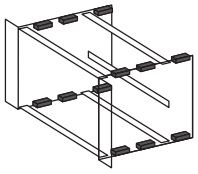
☑ Custom lengths available upon request.

Mounting blocks

For mounting covers, versions 1 – 4, on the subrack side panel.

Material:
Die-cast zinc, nickel-plated

Note:
For EMC applications, mounting blocks must be fitted across the entire subrack depth. The table here shows the number of mounting blocks required to install 1 cover plate with EMC shielding.



EMC

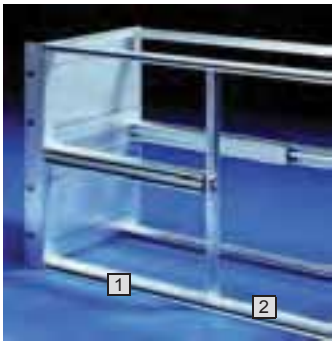
	Packs of	Model No. RP
Mounting blocks 28.5 mm long	10	**3684.234**

Also required:

Assembly screws M3 x 6, packs of 100.
Model No. RP 3684.233.
see page 159.

Number of mounting blocks for max. EMC protection	Cover plate depth mm
4	142
8	192
10	212
12	252
14	272
16	312
18	332
20	372
24	432
28	492
32	552

Mounting kits



Vertical mounting kit

For the combined installation of single and double Euroboards in 6U and 9U subracks.

Material:
Aluminum, clear-chromated

Supply includes:
2 front horizontal rails,
1 adapter rail,
2 threaded inserts,
1 vertical support (from 12 HP),
assembly parts.

Accessories:

Front panel, see page 126.
EMC gaskets, horizontal, see page 125.

6U (2 x 3U)

HP [1] (2 x 3U)	HP [2] (6U)	Model No. RP
14	68	**3684.220**
21	61	**3684.221**
28	54	**3684.222**
40	42	**3684.223**
42	40	**3684.224**

9U (1 x 6U + 1 x 3U)

HP (9U)	HP (1 x 6 + 1 x 3U)	Model No. RP
80	4	**3684.225**
76	8	**3684.226**
70	12	**3684.227**
66	16	**3684.228**
62	20	**3684.229**

Custom versions available upon request.

Vertical support

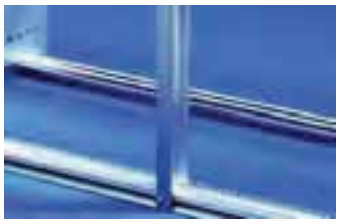
Required for the combined installation of single, double and triple Euroboards in one subrack.

Material:
Aluminum, extruded

Surface finish:
Clear-chromated

U	Packs of	Model No. RP
6	1	**3684.678**
9	1	**3684.679**

Custom versions available upon request.



Front panel

To conceal the vertical support of the vertical divider kit.

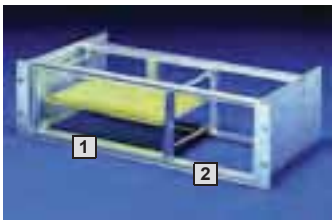
Material:
Aluminum, anodized

Supply includes:
Assembly parts.

U	HP	Packs of	Model No. RP
6	2	1	**3685.176**
9	2	1	**3685.286**

Custom versions available upon request.

EMC version.
see page 152.



Horizontal mounting kit

For the horizontal installation of 6U/9U PCBs in 3U/4U subracks.

[1] Horizontal installation space:
3U subrack: 20 HP (5 slots)
4U subrack: 28 HP (7 slots)

[2] Vertical installation space:
(when installing double Euroboards)
31 HP (without trim frame)
28 HP (with trim frame)

Material:
Aluminum, clear-chromated

Supply includes:
2 horizontal rails, front,
2 horizontal rails, rear,
1 or 2 horizontal rails, rear, center,
2 threaded inserts,
4 or 6 insulating strips,
4 connecting parts,
assembly parts.

For backplane assembly
with standard horizontal rail, front

U horizontal	Model No. RP	
	for 3U subrack	for 4U subrack
6	**3684.206**	**3684.208**
9	**3684.207**	**3684.209**

For backplane assembly,
front horizontal rail with 10 mm extension

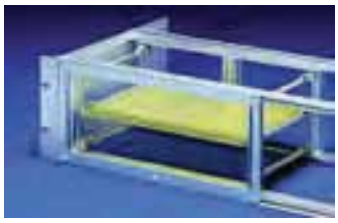
U horizontal	Model No. RP	
	for 3U subrack	for 4U subrack
6	**3684.210**	**3684.212**
9	**3684.211**	**3684.213**

Custom versions available upon request.

Accessories:

Trim frame.
see page 127.

Mounting kits/guide Rails



Trim frame

for horizontal mounting kit
To conceal the front sections of the horizontal mounting kit.

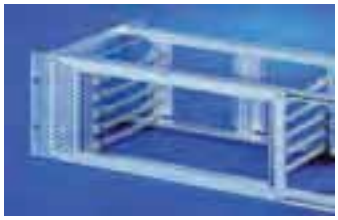
Material:
Aluminum, anodized

U horizontal	HP	Model No. RP	
		for 3U subrack	for 4U subrack
6	56	**3685.783**	**3685.785**
9	84	**3685.784**	**3685.786**

Custom versions available upon request.

Also required:

Collar screws and plastic collars,
packs of 100 sets, Model No. RP 3658.160.
see page 159.



Trim frame, vented

for horizontal mounting kit
To conceal the front sections of the horizontal mounting kit.

Material:
Aluminum

Surface finish:
Anodized
clear-chromated (EMC version)

Supply includes:
EMC accessories
(with EMC version).

EMC

U horizontal	HP	Model No. RP	
		for 3U subrack	for 4U subrack
6	63	**3685.787**	**3685.788**

Also required:

Collar screws and plastic collars,
packs of 100 sets, Model No. RP 3658.160.
see page 160.

EMC version

U horizontal	HP	Model No. RP	
		for 3U subrack	for 4U subrack
6	63	**3685.291**	**3685.292**

Custom versions available upon request.

Also required:

Centering screws,
packs of 100, Model No. RP 3687.050.
see page 160 .

Plastic guide rails

For 160, 220 and 280 mm PCBs up to 2 mm nominal thickness.

2 versions are available:
- Snap-in-fastening and screw-fastening
- Snap-in-fastening

Material:
Polycarbonate, base material to UL 94-V0

PCB depth mm	Packs of	Model No. RP	
		Snap-in-fastening/ screw-fastening [1]	Snap-in-fastening
100	1	–	**3688.005**
160	10	**3688.048**	**3688.045**
220	10	**3688,049**	**3688.046**
280	10	**3688.052**	**3688.047**

Also required:

[1] Assembly screws,
packs of 100, Model No. RP 3654.360.
see page 159.

Plastic guide rails

For contact spring fitting
For 160, 220 and 280 mm PCBs up to 2 mm nominal thickness. By installing contact springs, an electrical connection can be made between the PCB and the assembly.

Material:
Polycarbonate, base material to UL 94-V0

PCB depth mm	Packs of	Model No. RP
160	10	**3688.053**
220	10	**3688.054**
280	10	**3688.056**

Accessories:

Contact springs.
see page 128.

Guide Rails

Contact springs

For electrical connection between the PCB and the subrack, or to discharge static charges from the PCB.
Suitable for installation in “guide rails for contact spring fitting” and “end pieces for guide rails”.

Packs of	Model No. RP
10	**3687.726**

1

2

Guide rails, aluminum

For high loads. Suitable for a nominal PCB thicknesses of 1.6 mm. A distinction is made between guide rails for and without end pieces. The guide rails without end pieces are screw-fastened directly into the horizontal rail.

Material:
Aluminum

PCB depth mm	Packs of	Model No. RP	
		1 Without end piece [1)]	2 For end pieces
160	1	**3687.526**	**3684.663**
220	1	**3687.527**	**3684.664**
280	1	**3687.528**	**3684.665**
160	10	**3688.064**	**3688.057**
220	10	**3688.065**	**3688.058**
280	10	**3688.066**	**3688.059**
1000	1	**3684.666**	–

Also required:

[1)] Screw M2.5 x 6, packs of 100.
Model No. RP 3654.340, see page 159.
[1)] Nut M2.5, packs of 100.
Model No. RP 3654.370, see page 159.
[1)] Retaining cage M2.5, packs of 100.

End pieces

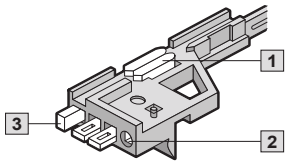
for guide rails, aluminum
To discharge static charges, contact springs RP 3687.726 may be used.

Material:
Polycarbonate, base material to UL 94-V1

	Packs of	Model No. RP
End piece, front	1	**3684.759**
End piece, rear	1	**3685.668**
End pieces, pairs	10	**3688.028**

Accessories:

Contact springs.
see page 128.



Keyable guide rails, plastic

Guide rails 4 HP, keyable, to IEEE 1101.10.
- For 1.6 – 2.0 mm nominal thickness
- Chambers for the installation of keys
- Option of installing ESD contacts to discharge static charges
- Narrow design for maximum air flow
- Various color variants to identify the slots:
  - Red for system slot
  - Green for power supply
  - Yellow and grey for board-type plug-in units

1 ESD contact for guide rails
2 ESD contact for front panel
3 Keys

Material:
Polycarbonate, base material to UL 94-V0

Note:
Only for use in conjunction with type IV, IVs, VII injector/extractor handles.

Accessories:

Keys, see page 132.
ESD contact, see page 131.
Extractor handles type IV, IVs, VII, see pages 142 - 149.

Aluminum, clear-chromated

For PCB depth mm	Packs of	Model No. RP			
		Grey	Red	Green	Yellow
160	10	**3685.257**	–	–	–
220	10	**3685.258**	–	–	–
280	10	**3685.259**	–	–	–
160	1	**3684.669**	**3686.063**	**3688.055**	**3689.089**
220	1	**3684.953**	**9902.240**	–	**3689.091**
280	1	**3684.954**	–	–	**3689.093**

Guide Rails

Keyable guide rails

with $^1/_2$ HP offset
Guide rails with $^1/_2$ HP offset for use e.g. in telecom applications. This allows PCBs to be populated on both sides. Green guide rails with offset are prescribed in the specification (PICMG 2.11) for the installation of power supply units.

- For 1.6 – 2.0 mm PCB thickness
- 4 HP x 160/220 mm
- Narrow design for maximum air flow
- Chambers for the installation of keys
- Option of installing ESD contacts to discharge static charges

Material:
Polycarbonate, base material to UL 94-V0

Note:
Only suitable for use in conjunction with extractor handles type IV, IVs, VII with $^1/_2$ HP offset.

For PCB depth mm	Packs of	Color	Model No. RP
160	10	Grey	**3688.062**
	1	Grey	**3686.137**
		Yellow	**3689.090**
		Green	**3687.832**
20	10	Grey	**3688.060**
	1	Grey	**3686.136**
		Yellow	**3689.092**

Accessories:

Keys, see page 132.
ESD contact, see page 131.
Extractor handles type IVs, VII with $^1/_2$ HP offset, see pages 143 - 144.

Keyable guide rails

For I/O assemblies
Guide rails 4 HP, keyable, to IEEE 1101.10. Prepared to accommodate a ground contact for assembly of a plug-type connection.

- For 1.6 – 2.0 mm nominal thickness
- For 80 mm deep PCBs
- Chambers for the installation of keys
- Option of installing ESD contacts to discharge static charges
- Narrow design for maximum air flow

Material:
Polycarbonate, base material to UL 94-V0

Note:
Only for use in conjunction with type IV, IVs, VII injector/extractor handles.

Color	For PCB depth mm	Packs of	Model No. RP	
			Guide rails	
			Top	Bottom
Grey	80	1	**3687.936**	**3687.937**
Yellow	80	1	**3689.097**	**3689.098**

Accessories:

Keys, see page 132.
ESD contact, see page 131.
Ground contact, see page 129.
Extractor handles type IV, IVs, VII. see pages 142 - 149.

Ground contact

Ensures a plug-in ground connection. UL-approved.

Material:
Die-cast zinc

Supply includes:
Grounding bush, contact spring.

Note:
Only suitable for use in conjunction with keyable guide rails for rear I/O assemblies.

	Model No. RP	
	1 set	50 sets
Grounding bush and contact spring	**3689.036**	**3687.951**

Also required:

Assembly screws 3.5 x 12 mm, packs of 50, Model No. RP 3684.109. see page 160.

VPX 5HP Card Guide *

Card guides to accommodate VPX's unique offset panel spacing. Allows standard (non-VPX) panels to be plugged into the slots.

VPX 5HP Card Guide, Front	PMP00005
VPX 5HP Card Guide, Rear Top	PMP00007
VPX 5HP Card Guide, Rear Bottom	PMP00008

* Not sold individually

Guide Rails

Keyable guide rails, aluminum, three-part

Keyable guide rails with aluminum center part, for high mechanical loads.
Suitable for 1.6 - 2.0 mm PCB thickness.

The guide rails are compiled from the following individual components:

1 2 end pieces
2 1 aluminum center part
3 Insulating center part(s)

1 End Pieces

for three-part guide rails
For 1.6 – 2.0 mm PCB thickness.

Material:
Polycarbonate, base material to UL 94-V0

	Packs of	Model No. RP
	10 pairs	**3685.265**
front end piece	1	**3685.790**
rear end piece	1	**3684.670**

Note:
A front and a rear end piece is required for each guide rail.

2 Aluminum center part

for three-part guide rails
For 1.6 – 2.0 mm PCB thickness.

Material:
Aluminum, unplated

For PCB depth mm	Model No. RP	
	Packs of = 1	Packs of = 10
220	**3684.673**	**3685.260**
280	**3684.674**	**3685.261**
340	**3684.675**	**3685.262**
400	**3684.676**	**3685.263**
1000	**3684.672**	**–**

3 Insulated center part

for three-part guide rails
The insulated center part is pushed onto the aluminum center part
length: 60mm.

Material:
Plastic, self-extinguishing to UL 94-V0

Packs of	Model No. RP
1	**3684.677**
10	**3685.264**

For PCB depth mm	Number of insulating strips required
160	1
220	2
280	3
340	4
400	5

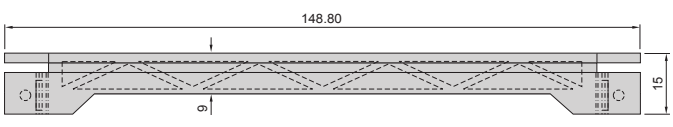
Guide rails for 4.4”

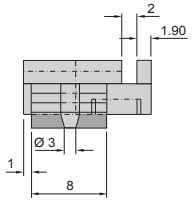
Snap-fastening guide rails to accommodate PCBs and assemblies with a height of 4.4″.

Material:
Macrolon

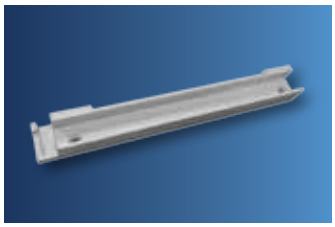
Color:
Dark grey

For PCB depth mm	Packs of	Model No. RP
160	1	**3686.990**





Guide Rails



Conduction cooled card guides *

Conduction cooled card guides. Allow conduction-cooled boards to be used in an air-cooled system for development/testing purposes.

Type	Model Number
Standard IEEE bottom	9922514
Standard IEEE top	9922515
OpenVPX bottom	9922667
OpenVPX top	9922668

* Not sold individually

Guide rails

for box type plug-in units
For PCB depth 1.6 mm.
For insertion into covers with vent slots (from 12 HP).

Material:
Noryl

For PCB depth mm	Packs of	Model No. RP
160	10	**3606.140**
220	10	**3606.200**

Air block panel

for unused slots
To conceal unused slots and prevent unwanted airflow. The air block panel simply snaps into position on the guide rails.

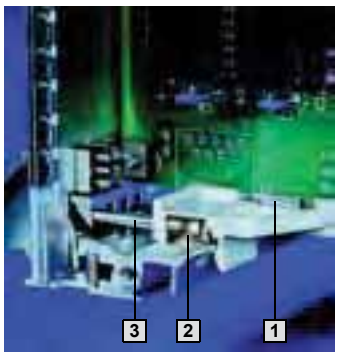
Material:
Polycarbonate, self-extinguishing to UL 94-V0

Color:
Blue

Note:
Not suitable for use in conjunction with guide rails with $^{1}/_{2}$ HP offset.

For keyable guide rails	Packs of	Model No. RP
160 mm	1	**3687.924**

*See pg. 151 for air slot blocker boards.



ESD contacts

for installation in keyable guide rails.
To discharge static charges.

1 **ESD contact for guide rail**
For permanent direct discharge via the PCB.

2 **ESD contact for front panel**
To discharge static charges in conjunction with the ESD pin. For insertion into the end piece of the guide rail.

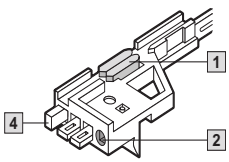
3 **ESD pin**

4 **Keys**

Material:

1 Stainless steel

2 Tin bronze, tin-plated



ESD contact for	Packs of	Model No. RP
Guide rail	50	**3684.204**
Front panel	50	**3684.205**

Note:
Only for use in conjunction with extractor handle with ESD pin (type IV, IVs, VII),
see pages 142 - 149.

Keying/PCB ejectors

Keys

Keys are used for coding of board-type plug-in units and prevent the use of assemblies in incorrect slots. The keys are inserted into the chambers of the keyable guide rails and the injector/extractor handles, types IV, IVs and VII (4 positions are possible). This produces 64 keying combinations per guide rail. When keying the top and bottom guide rail, 4096 potential combinations are possible.

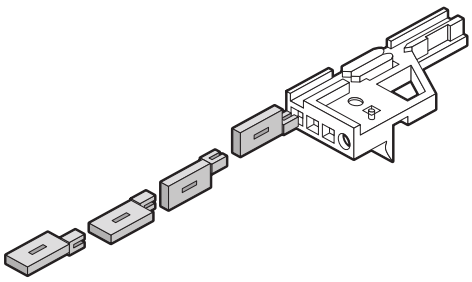
Standards:
IEEE 1101.10, IEC 60 297-5-104

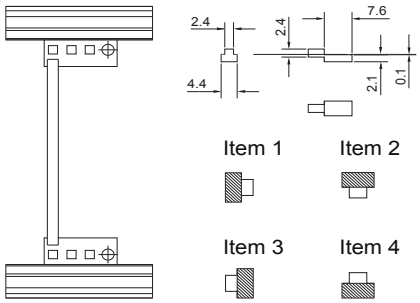
Material:
Plastic, PBTP, basic material to UL 94-V0

Color	Packs of	Model No. RP
Grey	100	**3684.325**
Red	100	**3684.326**

Accessories:

Keying tool,
see page 132.





Keying tool

For simple assembly of keys. Up to 3 coding keys may be fitted simultaneously. An integral alignment pin makes positioning easier.

Material:
Polycarbonate, base material to UL 94-V0

Packs of	Model No. RP
1	**3687.956**

1

2

PCB ejector/retainer

The two-piece PCB ejector is used for securing and extracting PCBs without front panels. The base section may also be used separately for board retention only.

Material:
Polycarbonate, base material to UL 94-V0

	Packs of	Model No. RP
1 PCB ejector/ retainer	10	**3687.014**
2 PCB retainer	10	**3687.052**

Covers for subracks

Cover

For subrack Ripac EASY
- Perforated or solid
- Optional screw-fastening to the side panels with mounting clips for additional support

Cover plates, version 1, slide-in:
The cover plates simply slide into the front horizontal and rear horizontal rails for backplane/connector mounting.

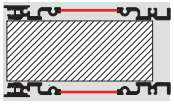
Cover plates, version 2, slide-in/screw-fastened:
In this application example, additional horizontal rails for backplane mounting are fitted at the rear. The horizontal rails for backplane/connector mounting are available for top-mounting.

The cover plates simply slide into the front and rear rear horizontal rails for backplane mounting.

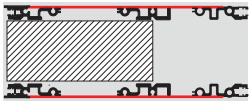
Material:
Aluminum

Supply includes:
2 covers

Version 1



Version 2



Version 1

HP	For side panel depth mm	Model No. RP	
		Perforated	Solid
84	175	**3634.685**	**3634.675**
84	235	**3634.690**	**3634.680**

Version 2

HP	For side panel depth mm	Model No. RP	
		Perforated[1)]	Solid[1)]
84	175	**3634.650**	**3634.625**
84	235	**3634.655**	**3634.630**
84	295	**3634.660**	**3634.635**
84	355	**3634.665**	**3634.640**
84	415	**3634.670**	**3634.645**

☑ Custom versions available upon request.

Also required:

[1)] Assembly screws, packs of 100,
Model No. RP 3634.233, see page 159.

Accessories:

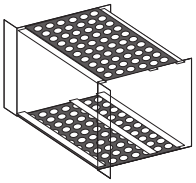
Mounting clips

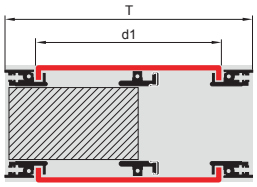
Packs of	Model No. RP
50	**3634.450**

Assembly screws for mounting clips

Packs of	Model No. RP
100	**3634.420**

Covers for subracks





Covers version 1

For all Ripac Vario, Ripac Vario EMC, Ripac Compact and Ripac Vario Mobil subracks.
To cover the overall subrack depth (EMC application) or as connector protection.

- Flat design for top and bottom
- Optionally solid or perforated
- For mounting on the subrack side panel with the aid of mounting blocks.

Material:
1.0 mm aluminum, unplated, hole diameter 4 mm in perforated version

Each set includes:
2 covers,
8 mounting blocks @ 28.5 mm,
24 assembly screws

Each individual unit includes:
1 cover

Note:
For EMC applications, additional mounting blocks must be fitted across the entire subrack depth.

HP	For side panel depth (T) mm	Cover depth (d1) mm	Model No. RP			
			Individual unit [1]		Set	
			perforated	solid	perforated	solid
21	225	192	**3687.618**	**3687.620**	**–**	–
21	285	252	**3687.619**	**3687.621**	**–**	–
42	175	142	**3684.957**	**3687.626**	**–**	–
42	225	192	**3687.623**	**3687.627**	**–**	–
42	245	212	**3684.958**	**3687.628**	**–**	–
42	285	252	**3685.642**	**3687.629**	**–**	–
84	175	142	**3684.681**	**3684.680**	**3685.245**	**3685.250**
84	225	192	**3684.694**	**3684.683**	**–**	–
84	235	202	**3685.851**	**3685.813**	**–**	–
84	245	212	**3684.695**	**3684.684**	**3685.246**	**3685.251**
84	285	252	**3684.696**	**3684.685**	**–**	–
84	295	262	**3685.855**	**3685.814**	**–**	–
84	305	272	**3685.852**	**3684.686**	**3685.247**	**3685.252**
84	345	312	**3684.698**	**3684.687**	**–**	–
84	365	332	**3685.853**	**3684.688**	**3685.248**	**3685.253**
84	405	372	**3684.700**	**3684.689**	**3685.249**	**3685.254**
84	465	432	**3684.701**	**3684.691**	**–**	–
84	525	492	**3684.702**	**3684.692**	**–**	–
84	585	552	**3684.703**	**3684.693**	**–**	–

☑ Custom versions available upon request.

Also required:

[1] Mounting blocks, see page 127.

[1] EMC gaskets for cover plates, see page 127.

[1] Assembly screws,
packs of 100, Model No. RP 3684.233,
see page 159.

Covers for subracks

Covers version 2

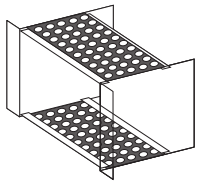
For all Ripac Vario, Ripac Vario EMC, Ripac Compact and Ripac Vario Mobil subracks.
To cover the PCB depth.

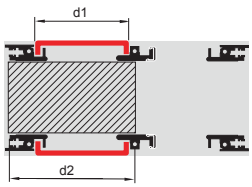
- Flat design for top and bottom
- Optionally solid or perforated
- For mounting on the subrack side panel with the aid of mounting blocks.

Material:
1.0 mm aluminum, unplated, hole diameter 4 mm in perforated version

Each set includes:
2 covers,
8 mounting blocks @ 28.5 mm,
24 assembly screws

Each individual unit includes:
1 cover.





HP	For PCB depth (d2) mm	Cover depth (d1) mm	Model No. RP			
			Individual unit[1]		Set	
			perforated	solid	perforated	solid
21	160	142	**3687.630**	**3687.634**	**–**	–
21	220	202	**3687.631**	**3687.635**	**–**	–
42	160	142	**3684.957**	**3687.626**	**–**	–
42	220	202	**3687.633**	**3687.637**	**–**	–
42	280	262	**3687.638**	**3687.639**	**–**	–
84	160	142	**3684.681**	**3684.680**	**3685.245**	**3685.250**
84	220	202	**3685.851**	**3685.813**	**–**	–
84	280	262	**3685.855**	**3685.814**	**–**	–
84	340	322	**3685.856**	**–**	–	–
84	400	382	**3685.857**	**–**	–	–

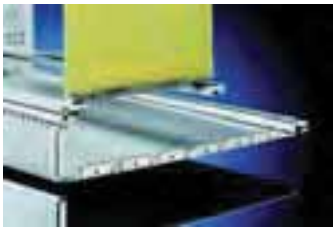
☑ Custom versions available upon request.

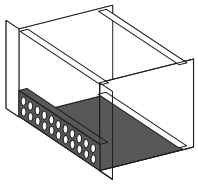
Also required:

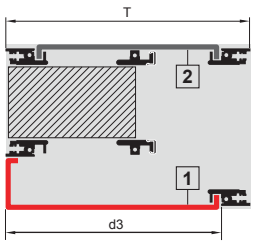
[1] Mounting blocks, see page 127.

[1] Assembly screws,
packs of 100, Model No. RP 3684.233,
see page 159.

Covers







Covers version 3

For all Ripac Vario, Ripac Vario EMC and Ripac Vario Mobil subracks.
To cover the overall subrack depth (EMC application).

- Cover with 1U edge fold (item 1), to conceal the 1U area in the subrack
- A version 1 flat cover (item 2) is additionally required
- Optionally perforated or solid front
- Suitable for subracks 4U (3 + 1), 7U (6 + 1)
- For mounting on the subrack side panel with the aid of mounting blocks.

Material:
1.0 mm aluminum, unplated, hole diameter 4 mm in perforated version

Note:
For EMC applications, mounting blocks must be fitted across the entire subrack depth.

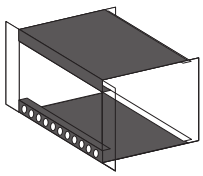
HP	For side panel depth (T) mm	Cover depth (d3) mm	Model No. RP	
			perforated	solid
84	285	270	**3684.720**	**3684.714**
84	345	330	**3684.721**	**3684.715**
84	405	390	**3684.722**	**3684.716**
84	465	450	**3684.723**	**3684.717**
84	525	510	**3684.724**	**3684.718**
84	585	570	**3684.725**	**3684.719**

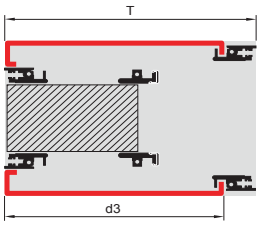
Custom versions available upon request.

Also required:

Mounting blocks, see page 127.
EMC gaskets for covers, see page 127.
Assembly screws.
packs of 100, Model No. RP 3684.233, see page 159.
Cover, version 1, see page 134.

Covers





Covers version 4

For all Ripac Vario, Ripac Vario EMC and Ripac Vario Mobil subracks.
To cover the overall subrack depth
(EMC application).

- Cover top/bottom with $^1/_2$ U edge fold to cover the $^1/_2$ U section in the subrack
- Optionally perforated or solid front
- Suitable for subracks 4U (3 + 2 x $^1/_2$), 7U (6 + 2 x $^1/_2$)
- For mounting on the subrack side panel with the aid of mounting blocks.

Material:
1.0 mm aluminum, unplated, hole diameter 4 mm in perforated version.

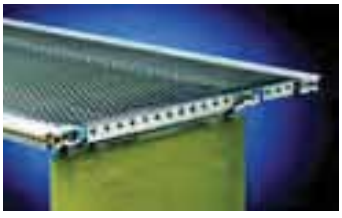
Note:
For EMC applications, mounting blocks must be fitted across the entire subrack depth.

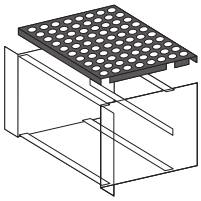
HP	For side panel depth (T) mm	Cover depth (d3) mm	Model No. RP	
			perforated	solid
84	285	270	**3684.732**	**3684.726**
84	345	330	**3684.733**	**3684.727**
84	405	390	**3684.734**	**3684.728**
84	465	450	**3684.735**	**3684.729**
84	525	510	**3684.736**	**3684.730**
84	585	570	**3684.737**	**3684.731**

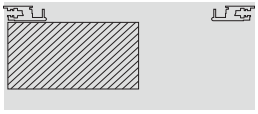
☑ Custom versions available upon request.

Also required:

Mounting blocks, see page 127.
EMC gaskets for covers, see page 127.
Assembly screws.
packs of 100, Model No. RP 3684.233,
see page 159.







Covers version 5

(snap-fastening)
For all Ripac Vario, Ripac Vario EMC and Ripac Vario Mobil subracks.
To cover the overall subrack depth or PCB depth.

Simple assembly:

- Side edge fold with half shears facilitates fast assembly (without mounting blocks) by simply snap-fastening
- Side notches for fitting horizontal rails in 160, 220 or 280 mm depth
- Optionally solid or perforated.

Material:
1.0 mm aluminum, unplated, hole diameter 4 mm in perforated version.

Supply includes:
2 gaskets.

HP	Position of side notches for horizontal rails mm	For side panel depth mm	Model No. RP	
			perforated	solid
21	160	175/185	**3687.624**	**–**
21	160/220	235	**3687.692**	**–**
42	160	175/185	**3687.625**	**–**
42	160/220	235	**3687.677**	**–**
42	160	245	**3687.640**	**–**
84	160	175/185	**3687.641**	**3687.647**
84	160	245	**3687.642**	**3687.648**
84	160/220	235	**3687.643**	**3687.649**
84	160/220	285	**3687.644**	**3687.650**
84	160/220	305	**3687.645**	**3687.651**
84	160/220/280	345	**3687.646**	**3687.652**

☑ Custom versions available upon request.